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AN AGE SCALE FOR THE MEASUREMENT OF MORAL JUDGMENT

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and
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THE tests in the field of character and personality have been aimed very largely at the measurement of so-called character traits. The existence of such traits, however, is somewhat in doubt. The individual's behavior is probably what we call honest, trustworthy, introvert, fair-minded, or reverse, according to the stimuli of the particular situation, not because of some inner faculty which is more or less strongly developed. Thus the attempts to measure personality in this manner have not been attended by striking success.

In the field of moral judgment or ethical discrimination, there seems to be more promise of finding suitable measures because there is no attempt to determine the magnitude of any trait, but rather to discover how far an individual has developed in relation to the moral and ethical standards of the society in which he lives. There is a real need for knowledge of this moral level, especially when an individual gets into trouble because of anti-social behavior. It has generally been assumed that when a boy or girl attains a certain chronological age, adult moral judgment is automatically attained, and that the individual is thereafter responsible for his acts. That is, the same attitude is taken in regard to the development of moral judgment as was taken toward the growth of general intelligence before the recent invention and use of intelligence tests. Differences in the ability to make moral and ethical discriminations have been known to exist, but their great range and greater significance has not been recognized.

Even now when the use of intelligence tests is a fairly common practice in dealing with problem cases, the assumption is usually made that the moral judgment and intelligence have grown in a parallel manner,

and that the individual is responsible according to his mental level. To some extent, of course, moral judgment is dependent upon intelligence. There are differences in moral judgment, however, among individuals of the same mental age, and this indicates that other factors enter into the ability to make ethical and moral discriminations. Thus, it seems clear that there is need of a standard measure in this field. It is the belief of the writers that the most useful form of measure would be an age scale, from which an idea of the level of development of moral judgment might be obtained, and with this belief in mind the Shields' Moral Judgment Examination described in this paper has been devised and tried out.[1]

The test in its present form consists of eight groups of tests placed in the even-numbered years from six to twenty, inclusive. The basis on which the tests were selected was that of conventional morality; that is, they were devised to fit more or less closely the generally accepted standards, both social and legal. None of the items were chosen with the idea of measuring fine ethical discriminations or philosophical distinctions. The tests attempt to take simple principles of justice, both social and legal, and to put them into the form of concrete situations and problems that the individual will meet in everyday life. The placement of the tests in the various ages is determined on the basis of what the average child of any age can do.

The following illustrations will help to make clear the nature of the examination.

YEAR VIII

1. Vocabulary. 10 words. The words are taken from a list of moral and legal terms arranged in the approximate order of their difficulty.
2. Comprehension. (2 of 3) What is the thing to do if you have broken a toy which belongs to a playmate? What is the thing to do if you see a boy taking something which does not belong to him? Should a policeman arrest a man who has not done anything wrong because he thinks the man might do something bad?
3. Definitions. Prison, Church, Christmas, 4th of July.
4. Comparison of offenses.
   Stealing $10 from some one's pocketbook.
   Killing a man by shooting him on purpose.
   Fighting a boy who throws a stone at you.
5. Sentences. Make sentences containing the words
   a. Cruel and arrest. b. Forgive and guilty.

[1] The test was devised by Shields, and standardized by him. Lincoln's contribution has been in outlining some of the work, and in statistical analysis of results. This paper was prepared in collaboration.

6. Judgment. Is it right or wrong to tease a playmate? To run away from home? To be afraid in the dark? To be boastful?

YEAR XVIII

1. Vocabulary. 35 words.
2. Moral situation. A man lent $1000 to another, and there was only one witness present. The borrower refuses to pay. The witness says that he will testify in favor of the lender if the latter will give him $10; otherwise he will testify in favor of the borrower. Should the lender pay the $10 (1) legally? (2) morally?
3. Difference between a. kill and execute;
   b. murder and assassinate; c. slay and massacre.
4. Similarities between a. law, ordinance and commandment;
   b. pardon, forgive and acquit.
5. Comparison of offenses.
   Stealing $60 from the pocketbook of a stranger.
   Stealing $40 from the pocketbook of a friend.
   Betraying one's country to the enemy.
   Robbing a man on the public highway.
   Assaulting a man by knocking him down and breaking his arm.
6. Opposite of disgrace, constant, profane.

The examination is administered and scored in much the same manner as the Stanford-Binet scale. The result is an age score called the Age of Responsibility. It is also possible to obtain a Responsibility Quotient by computing the ratio of the Age of Responsibility to the chronological age.

More than thirteen hundred subjects have been examined, but about one thousand of these took the tests in a form devised for group testing. This was done in order to try out some of the tests and to obtain data for a preliminary placement in the proper age group. Among the subjects examined were included pre-school children and college graduates, a group of delinquent girls, a special class of retarded children, and a few psychopathic cases.

The following tentative conclusions seem to be justified on the basis of the preliminary work with the test.

First, there is a gradual development of moral judgment from childhood to maturity, which, in this field, occurs at an age not yet determined, but most certainly well over sixteen on the average. We find, for example, that there are large numbers of high-school boys and girls from fifteen to seventeen who do not recognize many other moral differences that we generally take it for granted they do know. An important unanswered question is, at what age do moral concepts of this sort become clear to the average individual?

The gradual development of the moral judgment is well illustrated by the reactions of individuals of various ages on the vocabulary test. An example will make this clear. The word "guilty" has no meaning until the child is ten or eleven, and many at this age cannot give any definition. Those who do define it have a rather vague idea, such as "to do something;" "bad;" "responsible;" or "guilty of doing something." From twelve to fifteen the idea becomes clearer. It is then defined as, "not innocent;" "one who commits a wrong;" "found to have done a crime;" and, "one who has been found out." After sixteen there is a further development of the concept. Guilty is then defined as, "having committed a wrong;" "found to be wrong;" "culpable;" "condemned rightfully;" and, "blameable." Even at this age and later, however, the concept is not always clear and definite. Among a group of about thirty delinquent young women of normal intelligence, only a few could define the word satisfactorily, although nearly all of them could use it in a sentence.

Environment and training have a marked effect on the moral judgment of boys and girls. This appears especially in the reactions of children of foreign parentage. A twelve-year-old Italian boy in one of the comparison-of-offenses tests put stealing before murder. When asked if he really meant that stealing was worse than murder he replied, "Sure. They killed a man next door to our house last night." A girl of about the same age rated cursing or swearing as worse than murder. Inquiry revealed that she had had considerable religious training, and her moral judgment on this point was determined by the religious teaching of the Ten Commandments, in which swearing has an earlier place than killing. It is thus quite likely that test results will be significantly different in different social and racial groups.

A most interesting phase of the results is found in the differences in age of responsibility among individuals of the same general level of intelligence. There is necessarily some relationship between general mental ability and moral judgment because it is necessary for an individual to have a certain degree of mental ability before he can learn and understand laws and social customs well enough to develop any moral judgment, and it is clear that the ability to form higher and more involved moral concepts increases as general ability increases. Notwithstanding this, a comparison of Shields' test scores with the scores of intelligence tests shows that there are many individuals in which the development

of moral judgment has not proceeded at the same rate as the general mental growth. A product-moment correlation between the intelligence and responsibility quotients of fifty-four pupils who were given both the Shields' test and the Stanford-Binet gave a coefficient of .54±.06, and a coefficient of .58±.08 was obtained for a group of thirty-five pupils whose intelligence quotients were obtained from a group test. Clearly the Shields' test is not simply another test of intelligence.

The reliability of the scale has been studied by the Spearman-Brown method, using the odd and even items for the correlation. The reliability coefficient for 118 seventh-grade pupils was .81, while coefficients of .62, .83, and .93 were found for the separate age groups in which there were 20 or more cases, as shown in Table I. These reliabilities are high for single age-grade groups.

TABLE I

RELIABILITY COEFFICIENTS FOR THE SHIELDS MORAL JUDGMENT SCALE

	Grade VII						
Age	11	12	13	14	15	16	Total
No.	5	31	50	20	10	2	118
r		.62	.83	.93			.81

On the basis of reports by Otis and Knollin,[2] the reliability of the Stanford-Binet scale for adults is .92; and for those adults with mental ages between 13-0 and 16-11, a range of four years, the reliability coefficient is only .61. Lincoln[3] found the Stanford-Binet reliability coefficients for six-year-olds, by the Spearman-Brown technique, to range from .70 to .88, with .80 as a mean. Thus it appears that the reliability of this moral judgment scale compares very favorably with that of the Stanford-Binet.

There is one difficulty which the Shields' test, like all other moral judgment tests, does not, and probably cannot, avoid. This difficulty lies in the fact that there is no evidence of a high positive correlation between moral judgment as measured by any test and actual behavior. This, however, does not lessen the need for careful study of those individuals who become involved in difficulties of various sorts, and as an aid in this study the Shields' test should prove useful to those who deal with problem cases in clinic, court, or school.

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[2] Otis, A. S., and Knollin, H. E. "The Reliability of the Binet Scale and of Pedagogical Scales." *Journal of Educational Research*, IV (September, 1921), pp. 121-142.

[3] Lincoln, E. A. "The Reliability of the Stanford-Binet Scale, and the Constancy of Intelligence Quotients." *Journal of Educational Psychology*, XVIII (December, 1927), p. 621.

PERSONALITY TRAITS AND MATURING IN CHILDREN OF NORMAL IQ

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MOST of us are just beginning to accept seriously the statement that children are different persons at different times of their lives, and that the factor that causes this transformation is that of maturing. It is a problem, however, to decide whether the difference noticed in a child's behavior is merely a passing phase or whether it is a definite modification permanent enough to be reckoned with. Certain it is that a profitable understanding of boys and girls depends largely upon finding the answer to this problem of whether or not children really change; whether or not a youth is a different person from his younger self.

Although what one child will do cannot be predicted from the actions of another, still, by comparing the actions of *groups* of children, it is possible to gain a suggestion as to the chances of a child's really changing with maturity, provided always that the groups compared are made as homogeneous as can be except for the one factor to be studied as a possible cause of the change; i.e., the factor of maturing. Consequently, if children are separated into groups according to stage of maturity, the differences between the mass actions of these groups would, if other influences were accounted for, suggest roughly the changes that take place in children as they grow up.

Such a study was made of a group of school children, grades 4-12, in New Britain, Connecticut. Out of a group of about 4000 boys and girls, three stages, separated according to maturity, were made:

Stage 1 or immature children
Stage 2 or maturing children
Stage 3 or mature children.

Each of these divisions was subdivided according to sex, intelligence quotient, chronological age, and grade in school. Teachers' notations were secured for those children showing conspicuously some trait or traits of personality. The traits considered were:

1. Impatience with restrictions
2. Self-assertion
3. Sympathy for the weak
4. Interest in the opposite sex
5. Avoidance of the opposite sex
6. Coöperation
7. Interest in a particular occupation
8. Exploration
9. Evidence of religious awakening
10. Gregariousness
11. Interest in causes

12. Desire to reform others
13. Loyalty to a cause
14. Loyalty to a principle
15. Loyalty to a school
16. Loyalty to a clique
17. Loyalty to a person

This gave, then, several items for three groups of children differing in their stage of physiological development—their stage of maturing. The problem was to compare children in different stages of development to see how they differ in mass from each other; i.e., to see whether immature children are different from those who are maturing or those who have already matured. (See page 207 for the description of the data.)

To do this, the following differences were examined:

A. Differences in Stage of Maturing in Connection with Age and Grade
B. Differences in Stage of Maturing in the Exhibition of Certain Traits of Personality in Children of Normal IQ
C. Differences in Stage of Maturing in Connection with Sex

A. DIFFERENCES IN STAGE OF MATURING IN CONNECTION WITH AGE AND GRADE

Tables I, II, and III give material for examining stage differences in connection with age and grade.

What is an immature child like? Generally speaking, an immature child is quite young, rarely twelve years old (note in Table I the small percent of immature boys after that age). Also, with a few exceptions, at any chronological age (see Table II) the smallest percent of immature children is in the underage group and the largest in the overage group. This is natural, for the underage children at any grade will be the younger, and the chances are, the less mature; this fact offers confirmation of Baldwin's contention that the more mature at any age are the brighter.

Maturing boys and girls (stage 2 children) change rapidly into mature (stage 3), once they begin to change; the boys apparently remain in stage 2 longer than do the girls, since at the time of this investigation, there is a much larger proportion of maturing children among the boys than among the girls (see Table I). Most of the maturing boys are between 11 and 15 years of age; maturing girls are between 10 and 14. The mature boys are generally over 14; while the mature girls are over 13. But note the range in each case.

TABLE I

PERCENT OF CHILDREN IMMATURE AND MATURE AT EACH CHRONOLOGICAL AGE

C.A.		9	10	11	12	13	14	15	16	17	18	19	Total
Boys—													
Stage 1 Immature	No....	51	107	66	21	21	13	5	..	..	..	..	284
	Percent	74	57	35	09	07	04	02	..	..	..	..	
Stage 2 Maturing	No....	18	79	120	211	254	219	83	16	4	1	..	1005
	Percent	26	42	64	89	84	62	33	10	06	02	..	
Stage 3 Mature	No....	0	3	2	6	26	118	160	148	68	41	15	587
	Percent	00	01	01	02	09	34	65	90	94	98	100	
Total Boys	No....	69	189	188	238	301	350	248	164	72	42	15	·
Girls—													
Stage 1 Immature	No....	109	205	133	55	20	3	..	..	..	..	..	525
	Percent	93	75	44	19	05	01	..	..	..	..	..	
Stage 2 Maturing	No....	8	65	153	174	176	77	18	1	1	..	..	674
	Percent	07	24	51	60	47	24	08	01	01	..	..	
Stage 3 Mature	No....	0	2	16	60	183	243	210	181	143	43	15	1096
	Percent	00	01	05	21	48	75	92	99	99	100	100	
Total Girls	No....	117	272	302	289	379	323	228	182	144	43	15	

Early Maturing children

Late Maturing children

TABLE II

PERCENT OF CHILDREN UNDERAGE AND OVERAGE FOR GRADE AT EACH CHRONOLOGICAL AGE

		Boys												Girls										
C.A.		9	10	11	12	13	14	15	16	17	18	19	T	9	10	11	12	13	14	15	16	17	18	19	T
Underage—																									
Stage 1	No....	6	5	7	2	2	0	0					22	12	7	9	2	0	0						30
	Percent	12	05	11	10	10	0	0						11	03	07	04	0	0						
Stage 2	No....	0	2	16	19	9	6	4	1	0	0		57	0	5	14	8	7	2	1	0	0			37
	Percent	0	03	13	09	04	03	05	06	0				0	08	09	04	04	03	06	0	0			
Stage 3	No....		1	0	0	6	18	32	8	0	0	0	65		0	3	9	16	28	16	20	0	0	0	92
	Percent	0	33	0	0	23	15	20	05	0					0	19	15	09	12	08	11	0	0	0	
Overage—																									
Stage 1	No....	0	0	20	11	7	7	1					46	0	0	31	27	10	3						71
	Percent	0	0	80	52	33	54	20						0	0	23	49	50	100						
Stage 2	No....	0	0	30	68	63	93	44	6	1	1		306	0	0	35	71	49	25	15	0	1			196
	Percent	0	0	25	32	25	42	53	38	25	100			0	0	23	41	28	32	82	0	100			
Stage 3	No....		0	0	1	0	22	33	40	15	31	15	157		0	3	11	35	59	46	29	37	25	15	260
	Percent	0	0	0	17	0	19	21	27	22	76	100		0	0	19	18	19	24	22	16	26	56	100	

B. STAGE DIFFERENCES IN THE EXHIBITION OF CERTAIN TRAITS OF PERSONALITY IN CHILDREN OF NORMAL IQ

Some children mature earlier than others. One may find immature, maturing, and mature children at 11 years of age. Those who are mature have matured earlier, at a younger age, than have those who are only maturing or who are still immature at 11. There are, at least, two distinct types of children among these eleven-year-olds, those maturing early and those maturing late. In this study, these groups are called early and late maturing children. Again, in a group of maturing children, there will be some of 10, some of 11, 12, perhaps 13 and 14 years of age. It is evident that those who are maturing at 10 are early maturing compared with those who are still maturing at 14. Hence the

TABLE III

TRAITS SHOWN BY CHILDREN IN EACH STAGE OF MATURITY

Boys

Trait	Traits as Shown by Stage 1	Stage 2	Stage 3
1. Impatience with restrictions...	young	old	young (+)
2. Self-assertion			young
3. Sympathy for the weak.....	(—) late	late	(+)
4. Interest in opposite sex.....	(—) late	(—) late	(+)
5. Avoidance of opposite sex.....		(—)	(+)
6. Coöperation	young late	late	young
7. Interest in a particular occupation	late	late	(—) old
8. Exploration	young (+)		(—)
9. Evidence of religious awakening	(—) late	early (+) late	early (+)
10. Gregariousness	late	(—) late	(+)
11. Interest in causes.....	young late	(—) late	(+)
12. Desire to reform others.....	young late	(—) late	(+)
13. Loyalty to a cause.....	young		
14. Loyalty to a principle.....			
15. Loyalty to a school.....	(+) late	(—) late	
16. Loyalty to a clique.....		old	
17. Loyalty to a person.....	(—) old		(+)

Girls

Trait	Traits as Shown by Stage 1	Stage 2	Stage 3
1. Impatience with restrictions...	(—) old		(+)
2. Self-assertion	late old	late	young
3. Sympathy for the weak.....	(—)	young	(+) old
4. Interest in opposite sex.....	young (—)	early (—) old	early (+) old
5. Avoidance of opposite sex.....	late old	late old	(+) old
6. Coöperation	(—) old	early old	early old
7. Interest in a particular occupation	young	(—)	old
8. Exploration	late	early late	early
9. Evidence of religious awakening	(—) late	late old	(+) old
10. Gregariousness	(—)		(+) old
11. Interest in causes.....	late old	(—) late	(+)
12. Desire to reform others.....	young	(—)	(+) old
13. Loyalty to a cause.....		early	early
14. Loyalty to a principle.....	young (+)	young (—)	(—) old
15. Loyalty to a school.....	young		old
16. Loyalty to a clique.....	(—) late old	late old	(+) old
17. Loyalty to a person.....	late	early late	early old

Table III for boys should read: In stage 1, trait 1 is shown by the younger boys; it is shown in stage 2 by the older boys, and in stage 3 by the younger. Many more mature, or stage 3, boys show it than you would expect to show it were there no relationship between stage 3 and the showing of the trait; note the (+) in Stage 3.

younger children in a group homogeneous as to stage of maturity, are earlier maturing than the older. It is possible, then, for the younger children in a group homogeneous as to stage, and the early maturing in another group homogeneous as to chronological age, to be the same *type* of child, both early maturing.

In this paper, differences in the exhibition of traits does not mean differences in the *ways of traits are shown* by children, but differences in the *types of children* that show the traits. For instance, one trait might be shown by early maturing children in all three stages; hence, it would be shown alike (i.e., by the same type) in all three stages. It may be, however, that late maturing children show it in one stage and younger children in another. In this case, the trait is shown distinctively in each stage,[1] but not in the same way.

The report of the actions of the different groups in respect to these traits is recorded in Table IV, page 208. Table IV is summed up into a more easily read form in Table III, page 202, in which conclusions only are noted. What, then, are children of the different stages like as indicated by this summary of the traits they have shown?

(1) Not one trait among the boys or the girls (except perhaps, number 14, *Loyalty to a Principle,* for boys, which shows nothing distinctive) appears in exactly the same way for all three stages. The composite child of one stage differs from the composite child of another.

(2) Disregarding differences in the type of child showing the trait (older, younger, early or late maturing) and considering only whether or not the trait is shown in a distinctive manner in all three stages gives among the boys traits 1. *Impatience with Restrictions,* and 6. *Coöperation;* and among the girls, 2. *Self-assertion,* 5. *Avoidance of the Opposite Sex,* 8. *Exploration,* 17. *Loyalty to a Person,* and probably 13. *Loyalty to a Cause,* since, of course, no early maturing children can be determined for stage 1 (any evidence of maturing puts them in stage 2). All three stages are alike, then, in the showing of these traits by some *type* of child *in each stage.*

(3) In these very likenesses, however, it must be remembered that children of the different stages show the traits under different conditions. For instance, trait 1, *Impatience with Restrictions,* is quite obviously a third stage trait among the boys, but one shown largely by the younger children (note stage 3, Table III). In the second stage the older children

[1] Has a positive association with some type as indicated by a significant coefficient of association, Yule's "Q." See page 208.

show it. That is plausible, for maturing children are, as a rule, chronologically younger than mature children, and so older stage 2 and younger stage 3 may be the same. But there is no such reconciling of contradictions possible for the immature children; in the first stage the very young boys are the ones to exhibit trait 1. Do they develop into different persons, or are they, when young, free from inhibitions which the school later imposes and in defiance of which they stage a brief rebellion when they first mature? Trait 6, *Coöperation,* among the boys is shown in stage 1 by the late maturing and by the younger children, again a paradox, for the late maturing children would be older than the younger children of the same stage, of course. It is a situation which seems to suggest a definite relationship between late maturing and coöperation. Trait 2, *Self-assertion,* among the girls is shown in stage 1 by the late maturing and by the older children, who are, of course, the same. It is also shown by the late maturing in stage 2, and by the younger children in stage 3, quite possibly the same kind of individual. The three stages are apparently the same with regard to the exhibition of this trait. Just why traits 8 and 17, *Exploration* and *Loyalty to a Person,* should be shown by early and by late maturing rather than by normal maturing children is a question. They may be traits acquired as one grows older but that are shown earlier if one matures early. In one case it is training and in the other case, development. To the meagre extent of a very few traits, to wit, 2 and probably 5, *Self-assertion* and *Avoidance of the Opposite Sex,* the children of the three stages are the same kind of person.

It is interesting to note that nowhere are stages 1 and 3 alike but different from stage 2. Generally speaking, when two stages are alike, but different from a third, there is some similarity between the three although the three are not identical. The persons are about the same. There are some cases among the girls in which the persons seem different, as in trait 3, *Sympathy for the Weak,* for instance. It is practically absent among the immature, appears among the younger maturing children, and shows quite prominently among the older mature children. Trait 7, *Interest in a Particular Occupation* shows the same perversity; the younger first stage and the older third stage children show it, but the second stage children show it not at all. Trait 12, *Desire to Reform Others,* does the same thing. But this difference is all with the girls. Nothing of the sort is shown by the boys.

C. STAGE DIFFERENCES IN CONNECTION WITH SEX

A comparison of boys and girls shows some interesting situations (see Table III). Neither boys nor girls of stage 1 show traits 3, 4, and 9 to any extent, *Sympathy for the Weak, Interest in the Opposite Sex,* and *Evidences of Religious Awakening.* Trait 17, *Loyalty to a Person,* if shown by boys at all appears in the older ones. Late maturing (older) girls show it. Trait 1, *Impatience with Restrictions,* appears among the younger boys; the girls do not show it, or if they do, show it only among the younger children. Immature boys and girls, then, show more agreement in *what they do not* show than in *what they do.* They are alike in this respect.

In stage 2, children do not show traits 4, *Interest in the Opposite Sex,* 11, *Interest in Causes,* and 12, *Desire to Reform Others.* They show 16, *Loyalty to a Clique* among the older children. The boys show 3, *Sympathy for the Weak,* among the late maturing, while the girls only among the younger children. The boys do not show trait 5, *Avoidance of the Opposite Sex,* while the girls show it among the older children. The boys show 6, *Coöperation,* among the late maturing; the girls show it among both the older and the early maturing, evidently a trait of early maturing children. Again there is more agreement between boys and girls in what they do *not* show than in what they do.

In stage 3, *however,* there is a different story. With the exception of trait 8, *Exploration,* the mature children exhibit in the same fashion traits 1, *Impatience with Restrictions,* 2, *Self-assertion,* 3, *Sympathy for the Weak,* 4, *Interest in the Opposite Sex,* 5, *Avoidance of the Opposite Sex,* 9, *Evidence of Religious Awakening,* 10, *Gregariousness,* 11, *Interest in Causes,* and 12, *Desire to Reform Others.* Mature children certainly seem different persons from children of stages 1 and 2.

SUMMARY

This paper opened with the question: Are the children of the different stages of maturity different kinds of persons? Does maturing of itself affect a person in his reaction to his environment as shown by his exhibition of certain personality traits? An answer to this question was sought through securing in each of the three stages of maturity the numbers of children of normal IQ exhibiting certain traits. The effect of maturing has been separated as far as possible from the effect of chronological age (see page 207), so that a difference between stages would mean a difference between aspects of maturing and not merely a natural difference between older and younger children. All statements made

here are based on material showing + or − coefficients of association, each of which is significant inasmuch as each is at least five times its probable error.

The material has shown that: (1) Stage differences in connection with age and grade point out that the three stages overlap considerably; stage 1 is reasonably different from stage 3, but stage 2 partakes of both the other stages so far as differences in age and grade go. Also there is in stage 2 a much larger proportion of boys than of girls. There is here in this last item a difference between the stages that is due in part, at any rate, to maturing. The persons are different.

(2) Stage differences in connection with personality traits show that:

(a) Not one trait appears in exactly the same way for all three stages;

(b) In some respects among the boys traits 1, *Impatience with Restrictions,* and 6, *Coöperation,* appear conspicuously in all three stages; in some respects among the girls traits 2, *Self-assertion,* 5, *Avoidance of the Opposite Sex,* 8, *Exploration,* 13, *Loyalty to a Person,* are conspicuous in all three stages. Of these, 2 and 5 for girls are probably really alike for all three stages. Stages 1 and 2 are like each other, but different from stage 3 for trait 4, *Interest in the Opposite Sex,* in both boys and girls. Stages 2 and 3 are alike, but different from stage 1 for trait 9, *Evidence of Religious Awakening,* for the boys and for 6, *Coöperation,* 14, *Loyalty to a Principle,* and 16, *Loyalty to a Clique,* for the girls. The fact that nowhere are stages 1 and 3 alike but different for stage 2 seems to discourage the idea of a "passing phase" in connection with changes due to maturing. The persons are really different if changes appear.

(c) Nowhere are the conditions under which a trait is shown in the three stages *radically* different for the boys so far as can be told definitely,[2] but for the girls the difference between stages is obvious for 3, *Sympathy for the Weak,* 7, *Interest in a Particular Occupation,* and 12, *Desire to Reform Others.* The persons are different.

(3) Stage differences in connection with sex show stage 1 and stage 2 for boys and girls more alike in the traits they do *not* show than in the traits they do. Stage 3 boys and girls are alike in many of the traits they exhibit. In this respect, stage 3, mature, children certainly seem

[2] i.e., by conditions established by significant coefficients of association.

a different sort of person from the children of stages 1 and 2. The persons are different.

IMPLICATIONS

In view of these differences, were it advisable to do so, what could a school do to take account of this situation?

In the first place there should be some attempt to provide a junior high-school organization for second and third stage children, certainly by the time they reach the fifth grade, for by that time mature children, both boys and girls, begin to appear. There is really no reason why physiological examinations cannot be given as a matter of course at least once a year, though they ought to be given more often if possible. Since, according to Godin, physiological changes occur more often in warm weather than in cold, the examinations should be in the fall if possible; then the classification for the next term could be made more correctly on the basis of physiological stage than if the examination were made in the spring, and the child placed in school in the fall on the basis of a spring classification.

Whether stage 3 should also be sifted out is a question. In the case of the girls, undoubtedly stages 2 and 3 are more alike than stages 1 and 2; but this is not true for the boys. It is a tempting idea to play with—that of segregation. It would mean so much shifting, however, that the separating of the immature from the rest would be about the most that could be attempted under present conditions. It might be better to separate the mature from both the immature and the maturing. It seems quite evident, however, no matter what difficulties loom in the offing, that the schools should recognize more fully the differences in the characteristics of the different stages of maturity.

THE DATA[3]

Although the validity of the data on the study cannot be discussed here, it might be well to indicate briefly how each item was secured. Stage of maturity for these children was determined by a physical examination given to each child by the school physicians. The criteria used in this examination were compiled from those used by Crampton, Baldwin, et al. Three stages of maturity were noted: Stage 1, immature, Stage 2, maturing, and Stage 3, mature.

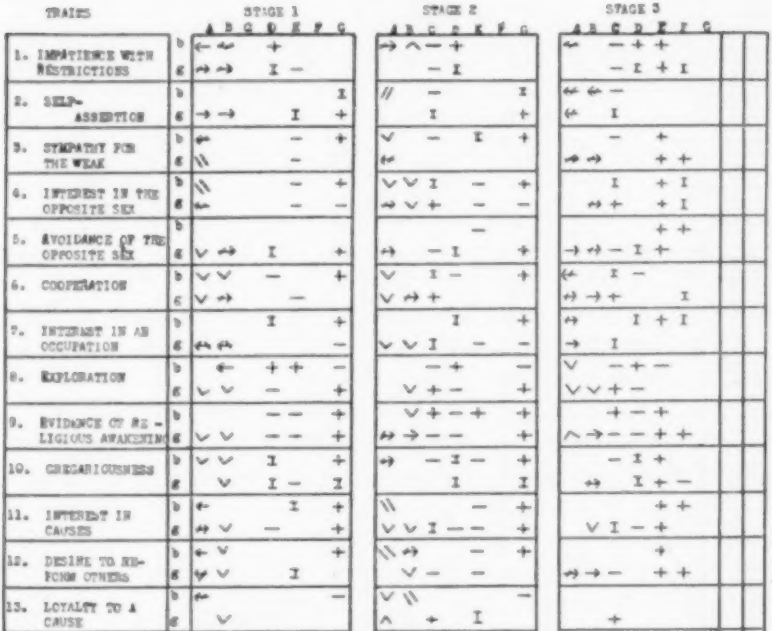
Chronological age and grade in school were taken from the school records. Personality traits, traits compiled from lists of those usually termed adolescent traits in modern educational literature, were so placed

[3] (For full discussion, see Leal, Mary A. *Physiological Maturity in Relation to Certain Characteristics of Boys and Girls*, University of Pennsylvania Thesis, 1929)

in a leaflet that the teachers needed only to check a trait when it was *conspicuously present* or *conspicuously absent* in a child. Teachers were warned that many children would have no checks at all in connection with traits. It is to these checked traits that reference is made when personality traits are discussed. The list of traits is on page 198.

TABLE IV

SUMMARY OF CHARACTERISTICS OF EACH STAGE OF MATURING FOR CHILDREN OF NORMAL IQ


TRAITS
STAGE 1
STAGE 2
STAGE 3
A B C D E F G
1. IMPATIENCE WITH RESTRICTIONS
2. SELF-ASSERTION
3. SYMPATHY FOR THE WEAK
4. INTEREST IN THE OPPOSITE SEX
5. AVOIDANCE OF THE OPPOSITE SEX
6. COOPERATION
7. INTEREST IN AN OCCUPATION
8. EXPLORATION
9. EVIDENCE OF RELIGIOUS AWAKENING
10. GREGARIOUSNESS
11. INTEREST IN CAUSES
12. DESIRE TO INFLUENCE OTHERS
13. LOYALTY TO A CAUSE
14. LOYALTY TO A PRINCIPLE
15. LOYALTY TO A SCHOOL
16. LOYALTY TO A CLIQUE
17. LOYALTY TO A PERSON

Key:

A. Relation to chronological age
B. Relation to grade in school
C. Association with early maturing
D. Association with normal maturing
E. Association in normal maturing with stage
F. Association in normal maturing with IQ
G. Association with late maturing

THE READING OF TABLE IV

The arrows such as are used in Table IV, indicate a series of percents, one for each chronological age or grade utilized, showing a trend

in the direction indicated by the arrows. An arrow that points toward the left in a chronological age distribution, signifies that the percents of children showing the trait are smaller and smaller as chronological age increases, for instance, 60 percent at 9 years, 45 percent at 10, 25 percent at 11, etc.; i.e., the trait appears much more frequently among the younger than among the older children. A broken line indicates a broken trend, usually one following more or less the path of the broken line. A + or a − indicates a plus or a minus association between the trait and the other factor dealt with in the column. In stage 1 for trait 1, column D, the boys show a + association with normal maturing; that is, you find boys normal age for maturing showing the trait in much larger numbers than the early and the late maturing show it. Association is found in this study by means of Yule's coefficient of association,[4] and when noted on Table IV as + or −, the coefficient is at least five times its probable error. "I" independent, means that the coefficient is within its probable error. Hence the associations noted in Table IV are quite definitely beyond the errors of sampling. In short, what is noted as + or − is present (or not present) in connection with the other factor to a greater extent than you would expect if there were not some relation between the two.

The basis for all percents and coefficients of association is *all children showing any trait at all* in some special group; i.e., children 9 years old, or children in the 4th grade, etc., so that 9-year-olds showing trait 1 are compared with 9-year-olds showing other traits, but not trait 1.

The first entry in this table reads: Of the children of normal IQ showing any trait at all, those showing trait 1 appear in smaller and smaller percents as the children grow older. The same is true, but less decidedly so, of distributions by grade, for the trend is broken (note the line crossing the arrow). Stage 1 has no early maturing that can be detected. Stage 1, as do the other stages, shows a + association with normal maturing; i.e., more children of normal age for maturing show the trait in comparison with the number of early and late who show it than you would expect were there not present some relation between maturing at a normal age and trait 1. There is no definite information about associations for columns E, F, and G; hence nothing is noted.

Out of the information in Table IV, came the information on traits as shown for the separate stages, in Table III.

[4] Yule, C. U. *An Introduction to the Theory of Statistics*, (London: Chas. Griffin and Company, 1927), 406 pp.

MENTAL AGE AND THE ARITHMETIC CURRICULUM: A SUMMARY OF THE COMMITTEE OF SEVEN GRADE PLACEMENT INVESTIGATIONS TO DATE

CARLETON WASHBURNE
Chairman of Committee of Seven,
Northern Illinois Conference on Supervision

Is there such a thing as mental readiness for the learning of an arithmetic process? If so, how can this readiness be measured? What are the effects of teaching a process before a child is mentally ready for it, as compared with the effects of teaching it after such readiness is reached? How can the arithmetic curriculum be reorganized in accordance with the psychological growth of the child, so that the child will meet each topic in the curriculum when he is mentally ready for that topic?

These are the questions which the Committee of Seven[1] of the Northern Illinois Conference on Supervision has been trying to answer through a series of investigations extending over a period of five years to date and involving the coöperation of 148 cities and many thousands of children.

The committee's results, to date, indicate clearly that for each arithmetic topic there is a stage in children's mental growth before which it is ineffective, if not futile, to teach that topic, but after which most children can learn it with reasonable effectiveness. This stage of development is found by having many children who represent a wide spread of mental ages taught the same topic for the same length of time and by the same method, by testing all these children with the same test six weeks after the completion of the teaching, and by comparing the retention test scores made by the children of the different mental ages.

The present day arithmetic curriculum takes no account of such facts as are being discovered through these investigations. School courses of study in arithmetic are determined largely by a logical order of arrange-

[1] The Committee of Seven consists of the following men: Orville T. Bright, Superintendent of Schools, Dolton; Harry O. Gillet, Principal, University of Chicago Elementary School, Chicago; J. Robb Harper, Superintendent of Schools, Wilmette; Howard C. Storm, Superintendent of Schools, Batavia; O. E. Peterson, Northern Illinois State Teachers College, DeKalb; Raymond W. Osborne, Associate Principal, Francis W. Parker School, Chicago; and Carleton W. Washburne, Superintendent of Schools, Winnetka.

ment: addition, subtraction, multiplication, and division of integers, fractions and decimals, mensuration, meaning of numbers, and other arithmetical concepts scattered along the way. It is a well-known fact that in the middle grades there are more school failures in arithmetic than in any other subject. The committee's investigations make it plain that many failures are inevitable with the present curriculum. They point the way to a revised curriculum, in which the arithmetic topics will be arranged in psychological rather than logical order, and in which the mental age and mathematical foundations of each child shall be made the basis for determining whether or not he is ready to undertake any given unit of work.

The technique used by the Committee of Seven for its coöperative experiments is comparatively simple. The grade in which a given topic is usually taught is first determined from a table in a previous committee study.[2] Plans are then made for having this topic taught in that grade, in the grade below, and in the grade above, according to the Committee of Seven procedure. Sometimes, as in the case of long division, it is necessary to have a topic taught two grades above the average in order to find the optimum point for teaching it. Occasionally it is practicable to have a topic taught in only two grades; if these include enough children of the mental ages immediately preceding and following the point of maximum efficiency, the two grades will suffice.

At any rate, coöperating cities are instructed to teach the topic under investigation in several specified grades. Before teaching it, however, they are requested to test all children concerned.[3]

They are first tested as to their knowledge of the prerequisite arithmetical foundations. In long division, for example, it is necessary for children to know short division, simple multiplication, and subtraction. The test in these prerequisites is called a foundations test. After the first foundations test has been given, a period of time is allowed in which

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[2] Washburne, Carleton. "When Should We Teach Arithmetic?—A Committee of Seven Investigation." *The Elementary School Journal*, XXVIII (May, 1928), pp. 659-665.

[3] The committee cannot refrain from a word of warm and hearty appreciation of the work of the coöperating superintendents and teachers. Bound, by their very numbers to be anonymous, they have nevertheless thrown themselves into the work, often upsetting their school routine, usually paying for their teaching materials and giving of their best in a truly scientific spirit. That so many cities would coöperate this way in controlled experiments is an exceedingly encouraging indication of the spread of the spirit of research in the field of education.

the teacher tries to remedy any defects shown by it and to give the children as nearly complete mastery of the foundation facts and processes as is possible within a limited time. Since these foundation topics have been taught beforehand, a period of two or three weeks is usually considered sufficient for review and remedying of defects. Then a second form of the foundations test is given, so that we may have a record of the exact standing of each child in regard to these foundations at the time he begins the experiment. Only the results of this second form of the foundations test, given after the period of review, are considered by the committee in its handling of the data.

About the same time that the second form of the foundations test is given, a test in the process that is about to be taught is also administered. This test covers the process involving the chief steps of learning each in a separate example. This process test is prepared in five or six equivalent forms, each containing exactly the same steps of learning and exactly the same types of examples. The form which is given at the beginning of the experiment is called the pre-test. Its purpose is to eliminate from the experiment any children who have had previous instruction in the process being studied.

A group intelligence test also is given at the beginning of the experiment to determine the mental ages of the children. The tests usually employed are the National Intelligence Test, the Otis Primary Intelligence Test, and, in the earlier experiments, Haggerty Delta I.

All tests are scored by the coöperating schools, and then are sent to the committee for rescoring and tabulating.

The teaching methods and often the teaching materials are prescribed in detail by the committee. The exact time to be allotted each day, the exact number of days that the experiment is to continue, the exact order of presentation of the various materials, the procedure in case a child is absent, and so on, are all definitely specified by the committee. The actual text materials have usually been written by one or more members of the committee, in an attempt to get uniformity of teaching procedure throughout the widely-scattered coöperating units.

At the end of the teaching period—usually from six to ten weeks—a "final test" is given to all the children. This is one of the forms of the process test above described. Two or three other forms have been used during the teaching process to determine the children's progress. So far, however, the committee has done nothing with the results of "progress test" forms; they are used by the teacher as helps in locating

pupil difficulties. The final tests, however, are sent to the committee for rechecking and tabulating.

Six weeks after the final test, a retention test is administered. This is the last form of the process test, equivalent to the final test and the pre-test, covering every important element of learning in the process under investigation. Between the final and the retention test, the teacher is asked not to review the subject at all, and, as far as practicable, to avoid teaching other topics that will involve the use of the topic in question. The retention tests, after being scored by the teachers, are sent to the committee for rescoring and tabulating.

Experimentation on each topic is directed by one member of the Committee of Seven, who undertakes full responsibility for it. Most of the detailed work for the committee, especially in the matter of securing coöperators, scoring tests, and tabulating results, is done by the Research Department of the Winnetka Public Schools.[4]

The data as received and tabulated have been handled in a variety of ways. The relationship between retention test scores and foundations test scores has been one of the most promising leads. It has shown the futility of attempting to teach a given topic or process in arithmetic until at least a reasonable degree of mastery of the prerequisite topics has been achieved. In many cases, virtually complete mastery of the preceding topics is indicated as the *sine qua non* of mastery of the new process.

The relation between mental age and ability to retain any given process is the other outstandingly important factor. It is this relationship that clearly indicates that there is a time before which it is ineffective to teach a given process and after which that process can be taught with comparative facility and with a reasonable degree of certainty of satisfactory retention.

The relationship between retention tests and final tests has been studied for practically every topic. In some cases it has given valuable light, the children being capable of temporary mastery and then rapidly losing it at certain mental ages, while the forgetting was very much less rapid at other mental ages. For the most part, however, the difference

[4] Miss Vivian Weedon, Director of the Research Department, and Mrs. Zella Sinninger, Research Assistant in charge of Committee of Seven studies, while not members of the committee, meet with it regularly and deserve full credit for their handling of the committee's work. Without their faithful, intelligent, and efficient coöperation, it would have been impossible to have conducted the experiments on anything like as large a scale as has been done.

between retention test scores and final test scores diminishes very gradually as mental age increases. This indicates that what is learned, even though it be a very small percentage of what we attempt to teach, is rather satisfactorily retained for at least six weeks.

To make practical applications to the curriculum has required the setting up of certain standards of proficiency as acceptable. Limitation of space precludes discussion of the rejected alternatives.

After trying out a number of possibilities, the committee decided that the most practical criterion from the standpoint of the teacher and school superintendent would be a certain degree of skill by a certain proportion of the children. The committee has therefore established the following standard:

No topic in arithmetic should be taught to a child until he has reached such a degree of skill in the prerequisite topics and such a mental age level that he will have at least three chances out of four of learning the topic sufficiently well to pass a retention test six weeks later with a score of 80 percent or higher.

This standard is, of course, subject to debate. Some teachers may feel that it is too high, others that it is too low. Some may feel that the retention period should be longer than six weeks; some may think it should be shorter, or that it should not be occupied with any reviews, while others may think that it should. And so on. There is not, as far as the committee knows, any immediately available means of determining objectively whether this standard is satisfactory or not. Ultimately, by measuring people's efficiency in life, one might be able to check the adequacy of the criterion. But even then one would still have to be arbitrary as to what degree of efficiency in life one wanted. There is a point beyond which strictly objective data cannot carry one and where joint judgment is the only means of setting up standards. This is always true when it comes to the purposes of education—the goals toward which it is moving.

The committee, in order to view the effect of mental age and prerequisite foundations, has been forced to keep constant such factors as time, teaching techniques, practice materials, etc. The findings of the committee point the way both to a curriculum ordered in terms of mental readiness and to further experimentation leading to the improvement of the factors mentioned above. Span of attention is an element which merits study, especially in the more complicated processes, as column addition, compound multiplication, long division, and fractions with unlike denominators.

Regardless of the standard one wishes to set up, regardless of the refinements in method and material that may later be achieved and of the amount of time spent on each topic, the *relative* position of the arithmetic topics as determined by the committee's investigations will quite conceivably remain unchanged.

The following topics have been investigated by the committee up to the present time: Addition Facts, by O. E. Peterson; Subtraction Facts, J. R. Harper; Subtraction Process, J. R. Harper; Meaning of Fractions, Harry O. Gillet, assisted by Louis E. Raths; Multiplication Facts, O. E. Peterson; Compound Multiplication, J. R. Harper; Addition and Subtraction of Fractions, Harry O. Gillet, assisted by Louis E. Raths; Simple Bar Graphs, Howard C. Storm; Addition and Subtraction of Decimals, Howard C. Storm; Short Division, Orville T. Bright, Jr., assisted by Geo. E. Staunton; Case I Percentage, Carleton Washburne, assisted by Vivian Weedon; and Long Division, Raymond Osborne.

During the school year 1930-31, the following additional topics will be completed: Column Addition, Division Facts, Simple Multiplication (1-place multiplier), Multiplication and Division of Fractions, Meaning of Decimals, Multiplication and Division of Decimals, and Case II Percentage. A beginning will probably be made in a series of investigations to cover the various phases of measurements and denominate numbers, and plans will be laid for carrying the investigation up into certain phases of junior and senior high-school mathematics, if it seems practicable to enter those fields.

The graphs presented here for the different topics studied are prepared *after eliminating the children who have not achieved an adequate mastery of the prerequisite topics*, as shown by their foundations test. Before making each of these graphs, the committee prepared graphs of the proportion of children at each level of foundations test scores who made 80 percent or better in the retention test, regardless of mental age. A study of these graphs usually made it quite evident what degree of mastery of the foundations test was necessary. These curves were generally of steadily increasing steepness up to the highest foundations score interval, with a decided concentration of children at this interval. Occasionally, however, as in the case of the subtraction process, the curve flattened out materially before reaching the topmost interval, almost as many children in the interval from 57 to 70 percent mastery of the subtraction facts reaching a score of 75 percent or higher in subtraction process as in the case of children who had foundations test scores of from 85 to 100 percent in subtraction facts.

Limitation of space prohibits the giving of the foundations test graphs. Some samples will be found in the committee's report in the Twenty-Ninth Yearbook.[5]

In this article are reproduced only those graphs that will be of direct practical help to the curriculum builder. The graphs show on the vertical scale the *percentage of children* at each mental age level who have attained approximately 80 percent mastery on the retention test for the process.[6]

The horizontal scale shows the mental age[7] of the children who are being considered. Children with the same mental age who had not made adequate foundations test scores have not been included in any of these graphs. The effect of including them, as shown by many graphs not here published, is simply to depress the curve without materially modifying its shape. Of course, in the case of addition facts and meaning of fractions where there are no foundations tests, the entire group was used.

Let us now consider each topic in turn, letting the reader draw his own conclusions to a considerable extent from the graphs themselves.

Addition Facts—Since there is a marked difference in the ability of children to learn the group of addition facts with sums of 10 and under and their ability to learn the group of addition facts with sums over 10,[8] the data were treated accordingly. The upper curve of Figure I shows that while there is much gain in the ability to master even the easier facts of addition clear up to the mental level of seven years eleven months, where practically every child achieves at least 80 percent mastery, the committee's criterion of three-fourths of the children reaching such mastery is almost met as low as six years five months and is much more than met by six years nine months of mental age. The futility of trying to teach these addition facts to children with the lowest mental scores found

[5] Washburne, Carleton W. "The Grade Placement of Arithmetic Topics." *Twenty-Ninth Yearbook of the National Society for the Study of Education*, pp. 641-670.

[6] When the retention test contained only 8 examples, 75 percent was used instead of 80 percent. When the test contained 16 examples, 81 percent was used, etc. Eighty percent will be used in referring to this standard in the article, while the exact percent is given in the graph headings.

[7] The mental age intervals are, in every case, in terms of half sigmas above and below the mean of the entire distribution of mental ages for the particular experiment. This makes all graphs directly comparable, the relative slant of the curves being significant.

[8] Washburne, Carleton, and Vogel, Mabel. "Are Any Number Combinations Inherently Difficult?" *Journal of Educational Research*, XVII (April, 1928), pp. 235 to 255.

in first-grade rooms is indicated by the lower end of the curve. Haggerty gives no mental age equivalents for test scores in these lower levels, but it can be assumed that they represent mental levels of about five years six months.

The lower curve on Figure I shows the data for the addition facts with sums over 10. The committee's standard is met at seven years four

Figure I

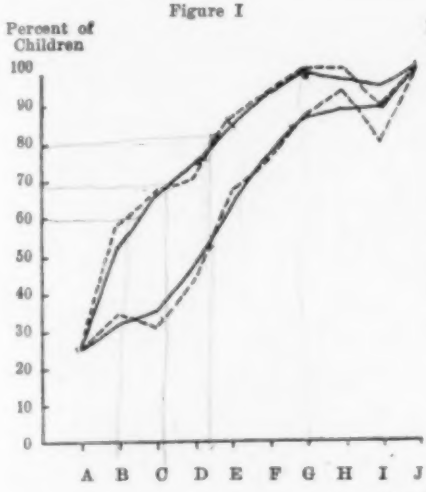

Figure II

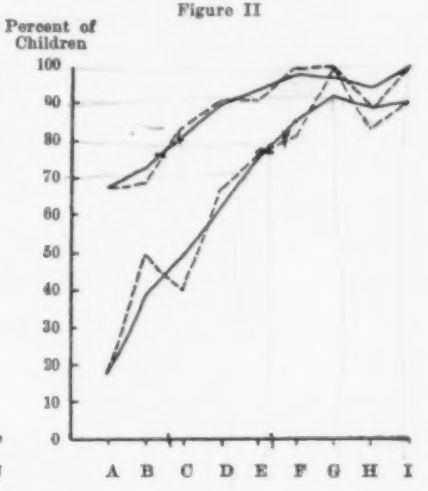

FIGURE I

ADDITION FACTS: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING 81 PERCENT OR BETTER ON A RETENTION TEST IN THE EASIER FACTS (UPPER CURVE) AND 78 PERCENT OR BETTER ON A RETENTION TEST IN THE HARDER FACTS (LOWER CURVE)

-------- Original curves
———— Smoothed curves

	A	B	C	D	E	F	G	H	I	J
Mental Levels			5-11 to 6-4	6-5 to 6-8	6-9 to 7-3	7-4 to 7-10	7-11 to 8-4	8-5 to 9-0	9-1 to 9-7	9-8 to 10-1.
No. of Children	20	52	97	96	85	49	30	34	10	6

FIGURE II

SUBTRACTION FACTS: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 80 PERCENT OR BETTER ON A RETENTION TEST IN BOTH THE EASIER AND HARDER FACTS

	A	B	C	D	E	F	G	H	I
Mental Levels	5-8 to 6-0	6-1 to 6-6	6-7 to 6-11	7-0 to 7-7	7-8 to 8-2	8-3 to 8-10	8-11 to 9-5	9-6 to 10-0	10-1 to 10.8
No. of Children (Upper Curve)	6	25	19	58	57	70	33	16	12
No. of Children (Lower Curve)	6	14	10	43	46	61	28	12	10

months of mental age, but there is material gain in postponement at least to seven years eleven months and possibly to eight years five months.

Figure II gives similar data for the easier and harder subtraction facts.[9] The foundations test for the subtraction facts was a test in addition facts; only the children making a score of 84 percent or higher in addition facts are considered in the upper curve of the graph which applies to the easier subtraction facts. It will be noticed that for these easier subtraction facts the committee's criterion is reached at a mental age of six years seven months by those children who have mastered the

Figure III

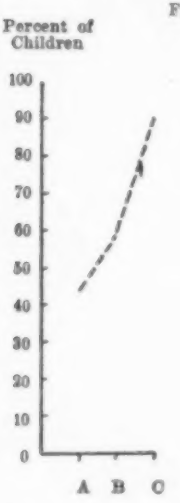

Figure IV

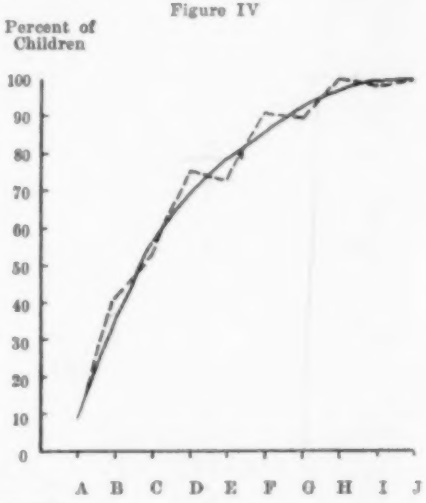

FIGURE III

SUBTRACTION PROCESS: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 75 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C
Mental Levels	7-10 to 8-2	8-3 to 8-8	8-9 to 9-0
No. of Children	9	12	10

FIGURE IV

MEANING OF FRACTIONS: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING 80 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C	D	E	F	G	H	I	J
Mental Levels	5-7 to 6-4	6-5 to 7-2	7-3 to 8-1	8-2 to 8-11	9-0 to 9-9	9-10 to 10-8	10-9 to 11-6	11-7 to 12-4	12-5 to 13-3	13-4 to 14-1
No. of Children	12	34	71	111	109	117	131	54	41	6

[9] Determined as in the case of the addition facts, by the study, "Are Any Number Combinations Inherently Difficult?"

addition facts. This is also the point of flection for the curve. For harder subtraction facts shown in the lower curve, 75 percent of the children reached a score of 80 percent or better on the retention test at a mental age of seven years eight months, but the curve rises steeply, showing marked gain through further postponement, to eight years eleven months. These data on the harder subtraction facts apply only to children who have made a score of 96 percent or higher in a test on addition facts before beginning their study of subtraction facts.

It will be noticed that the easier subtraction facts should probably be taught before the harder addition facts, although there is no harm in

Figure V

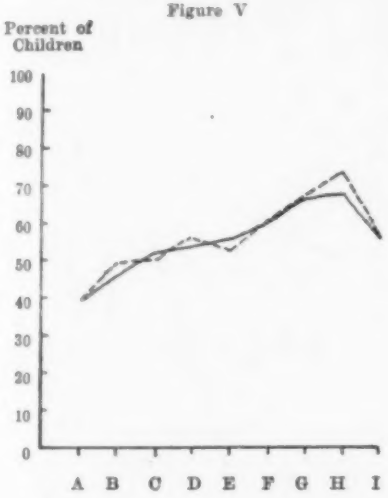

Figure VI

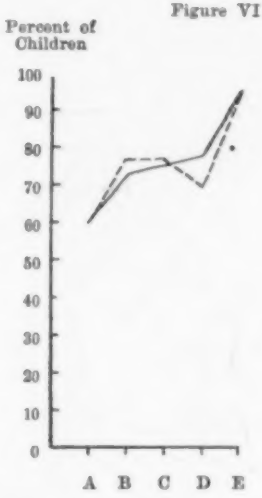

FIGURE V

MULTIPLICATION FACTS: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 80 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C	D	E	F	G	H	I
Mental Levels	7-6 to 7-9	7-10 to 8-3	8-4 to 8-9	8-10 to 9-3	9-4 to 9-7	9-8 to 10-1	10-2 to 10-7	10-8 to 11-3	11-4 to 12-3
No. of Children	8	40	72	111	113	82	67	30	11

FIGURE VI

COMPOUND MULTIPLICATION: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 83 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C	D	E
Mental Levels	8-9 to 9-3	9-4 to 9-9	9-10 to 10-3	10-4 to 10-11	11-0 to 12-1
No. of Children	29	51	33	39	14

postponing the easier subtraction facts until after seven years four months of mental age, when the children have mastered all their addition facts and will sail through their easier subtraction facts with no difficulty.

Figure III shows the situation for the subtraction process at the various mental levels after eliminating children whose scores on a foundations test involving subtraction facts were lower than 57 percent. This was one of the first subjects investigated. The number of children involved was small, and after eliminating those whose foundations scores were low, the number would seem very low indeed. In spite of the small numbers, however, the data show entire consistency on all graphs, and indi-

Figure VII

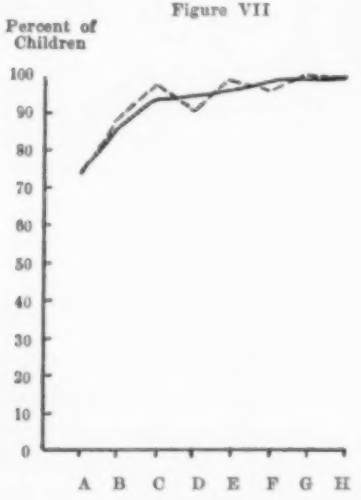

Figure VIII

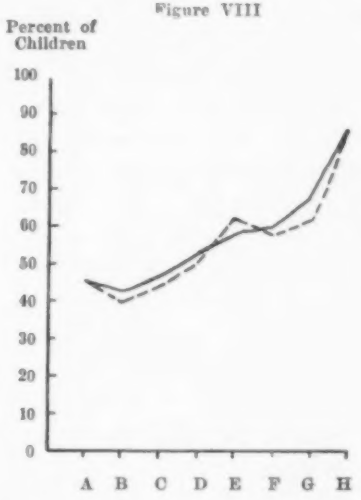

FIGURE VII

ADDITION AND SUBTRACTION OF LIKE FRACTIONS: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 77 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C	D	E	F	G	H
Mental Levels	9-1 to 9-9	9-10 to 10-9	10-7 to 11-0	11-1 to 11-7	11-8 to 12-2	12-3 to 13-0	13-1 to 13-9	13-10 to 14-7
No. of Children	11	25	36	47	45	28	21	7

FIGURE VIII

ADDITION AND SUBTRACTION OF UNLIKE FRACTIONS: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 80 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C	D	E	F	G	H
Mental Levels	9-1 to 9-9	9-10 to 10-6	10-7 to 11-0	11-1 to 11-7	11-8 to 12-2	12-3 to 13-0	13-1 to 13-9	13-10 to 14-7
No. of Children	11	25	36	47	45	28	21	7

cate clearly that the subtraction process involving borrowing or carrying should not be taught before a mental level of eight years nine months.

Figure IV deals with meaning of fractions exclusive of grouping. The test consists of being able to recognize or make one-half, one-third or two-thirds, one-fourth or three-fourths, one-fifth, two-fifths, three-fifths or four-fifths of an object, or of the number of objects indicated by the denominator of the fraction. The child would thus be able to color two-thirds of a square or recognize what part three apples are of five, etc. It does not include the ability to group objects, as in finding three-fourths of twelve objects (arranged in four groups of three each) or one-third of nine objects (arranged in three groups of three each). Seventy-five per cent of the children reach sufficient skill to do eight out of ten problems of this sort in a retention test by the time they reach the mental level of nine years. When the process is broken up into its separate aspects, it is found from graphs not reproduced here that the simpler forms with numerators of 1, such as recognizing one-fourth or one-half of an object, may be taught effectively at mental levels as low as six years five months, or even lower.

Figure V shows the situation for the multiplication facts. There seems to be no mental age at which three-fourths of the children reach 80 per-cent mastery of these! The curve flattens out definitely at ten years two months, at which time about two-thirds of the children reach 80 percent mastery, provided they have made scores of 92 to 100 percent in their addition facts test. This topic is probably one where a longer experience with the facts is necessary if anything like adequate mastery is to be achieved.

In connection with the study of compound multiplication, multiplication facts were used as a foundations test. The children had presumably studied multiplication facts to a point of satisfying the teacher the year before. They had gone clear through the process of simple multiplication (i.e., multiplying a 2-, 3-, 4-, or 5-place multiplicand by a 1-place multiplier), thereby thoroughly reviewing their multiplication facts. They had been definitely drilled in the multiplication facts in which they were weak after the first form of the foundations test, and were given a second form of the foundations test immediately after this review. Yet even under these conditions, it is not until the mental level of ten years four months that we find three-fourths of the children able to pass an 80 percent test in multiplication facts. There is, apparently, much more difficulty in learning multiplication facts than is ordinarily realized, and

it is decidedly ineffective to teach them before a mental age of ten years two months.

Figure VI for compound multiplication is rather freakish in form. It shows a sharp rise to a mental age of nine years four months, a flattening out to the mental age of ten years four months, and then another sharp rise to eleven years. Since multiplication facts cannot be taught effectively until a mental age of ten years two months, it would obviously be absurd to try to teach compound multiplication before the ten years four months mental level is reached. This graph, it must be remembered, has excluded that great bulk of children with mental ages below ten years four months who were not able to make a score of 93 to 100 percent on the foundations test in multiplication facts, a score of 89 to 100 percent in simple multiplication, and a score of 83 to 100 percent in column addition. Fortunately, the number of children in the experiment was sufficiently large so that after eliminating three-fourths of them on the ground of inadequate foundations test scores, we still had a reasonable number, 166, on which to base conclusions.

Figure VII analyzes the results of one of the different sections of the test in addition and subtraction of fractions and mixed numbers. The ability to add and subtract fractions and mixed numbers already having a common denominator (referred to as addition and subtraction of like fractions in the graphs) is readily acquired at a level as low as nine years ten months of mental age, by children who have a thorough grasp of the meaning of fractions (100 percent foundations test score) and of addition and subtraction facts (96 to 100 percent foundations test score), although there is an advantage in waiting until ten years seven months. In eight out of thirteen of the test examples, the answers had to be reduced to lower terms or to whole or mixed numbers.

The real bugbears in the addition and subtraction of fractions and mixed numbers are examples which involve finding a common denominator and examples in subtracting mixed numbers with carrying, e.g., $8\frac{2}{5}-3\frac{4}{5}$. (The graph refers to this section as addition and subtraction of unlike fractions.) Looking at Figure VIII we see that the committee's standard is reached only by the group having the highest mental ages, namely, 13 years 10 months to 14 years 7 months. In this group there are only seven children. Obviously, further investigation, with more children at higher mental levels, is needed.

One more point needs to be brought out in regard to fractions. It is of prime importance that the children have a genuine understanding of the meaning of fractions before they attempt any manipulation. Figure IX shows the relationship of children's scores in the foundations test on the meaning of fractions to the percent of children reaching the standard in the addition and subtraction of fractions and mixed numbers with like denominators, and in the addition and subtraction of

Figure IX

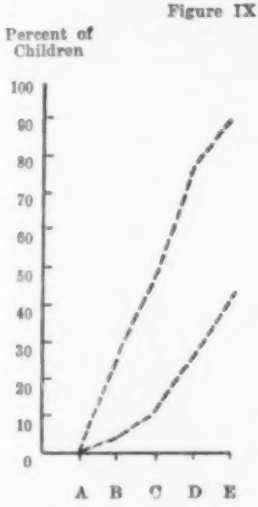

Figure X

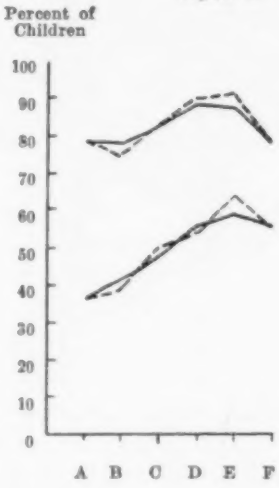

FIGURE IX

ADDITION AND SUBTRACTION OF FRACTIONS: PERCENT OF CHILDREN AT EACH INTERVAL OF A FOUNDATIONS TEST IN MEANING OF FRACTIONS MAKING 77 PERCENT ON A RETENTION TEST IN LIKE FRACTIONS (UPPER CURVE) AND 80 PERCENT ON A RETENTION TEST IN UNLIKE FRACTIONS (LOWER CURVE)

	A	B	C	D	E
Foundations Test Intervals (Percent)	0	25	50	75	100
No. of Children	12	50	114	204	339

FIGURE X

ADDITION AND SUBTRACTION OF DECIMALS: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 82 PERCENT OR BETTER IN PROCESS (UPPER CURVE) AND ACCURACY (LOWER CURVE) ON THE RETENTION TEST

	A	B	C	D	E	F
Mental Levels	10-0 to 10-3	10-4 to 10-6	10-7 to 10-10	10-11 to 11-5	11-6 to 11-11	12-0 to 12-5
No. of Children	14	8	12	20	11	9

fractions and mixed numbers with unlike denominators and the subtraction of mixed numbers involving borrowing, respectively. Mental age is disregarded in this graph. Certainly, the steepness of these curves shows, unmistakably, the need for giving children a comprehensive grasp of what fractions mean before we teach them, or try to teach them, how to add and subtract fractions.

Children's ability to learn to read and make simple bar graphs was studied early in the committee's experimentation, before present techniques were fully developed. Therefore, we lack the type of data presented for the other topics. The investigation showed, however, that fifth-grade children having a median chronological age of ten years five months, but somewhat above the average in intelligence quotient (62 percentile rank on the National Intelligence Test), mastered the reading and making of simple bar graphs as easily as did equally bright children two years older.

Figure X shows the results in addition and subtraction of decimals with the tests corrected separately for process and accuracy. The foundations test score for the meaning of decimals is 79 to 100 percent; that for addition and subtraction of integers is 100 percent. The discrepancy between process and accuracy in addition and subtraction of decimals is distressingly large. Children were considered as passing the test satisfactorily from the standpoint of process if in such an example as $8.4+15+.015$ they wrote their addends, (or in case of subtraction, the minuend and subtrahend), under each other in the proper form with the decimal points in the right places, performed the right operation, and placed the decimal point in the right place in the answer, regardless of whether the answer was right or wrong. It will be seen that the committee's standard is nowhere reached if children's mastery is measured in terms of accuracy, while it is reached at every mental level included in the experiment when the results are measured merely in terms of correctness of process! This is an astonishing discrepancy since twelve weeks earlier the children had added and subtracted integers with 100 percent accuracy. The curve as to both process and accuracy tends to flatten out at ten years eleven months of mental age; so without any great feeling of certainty, the committee tentatively selects this mental age or the next one higher, eleven years six months, as the one at which to teach addition and subtraction of decimals.

Figure XI shows short division to be one of the badly misplaced topics in the arithmetic curriculum. The curve is still rapidly rising at the point where the committee's data stop, and even at the high mental age of eleven years four months, the committee's standard is not quite reached, only 73 percent of the children making 80 percent or better on the retention test, and this in spite of the fact that the children have made from 89 to 100 percent in a test on their division facts, and from 97 to 100 percent in a test on their subtraction facts. Certainly short

Figure XI

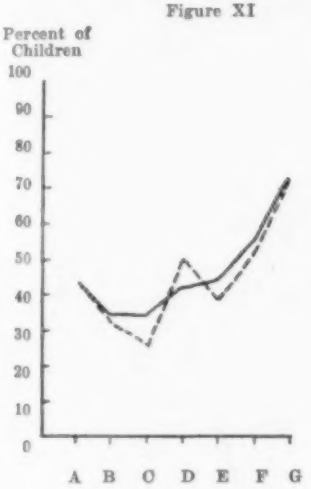

Figure XII

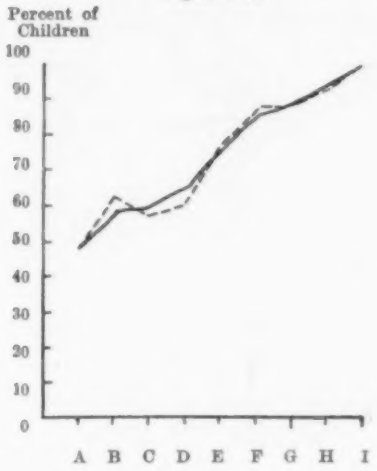

FIGURE XI

SHORT DIVISION: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 82 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C	D	E	F	G
Mental Levels	8-7 to 8-11	9-0 to 9-4	9-5 to 9-8	9-9 to 10-1	10-2 to 10-7	10-8 to 11-3	11-4 to 12-1
No. of Children	9	12	27	30	39	25	11

FIGURE XII

CASE I PERCENTAGE: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 81 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C	D	E	F	G	H	I
Mental Levels	9-9 to 10-5	10-6 to 11-0	11-1 to 11-7	11-8 to 12-3	12-4 to 13-0	13-1 to 13-10	13-11		
No. of Children	19	40	84	110	99	107	69	49	9

division should not be taught before a mental level of eleven years four months.

To save space, the graph showing the point at which the meaning of fractions involving grouping should be taught is omitted. By "grouping" we mean the recognition of such things as one-fourth of eight objects (arranged in 4 pairs), two-thirds of nine objects (arranged in three groups of three each), etc., before one has learned the manipulatory process of multiplying fractions. It is not until a mental level of eleven years seven months that 75 percent of the children can make a retention test score of 80 percent or better in this type of problem. Evidently, in teaching children in the lower grades the meaning of fractions, this element of "grouping" should be omitted. It could be taught in a review of meaning of fractions preceding the addition and subtraction of unlike fractions, or perhaps in connection with multiplication of fractions, the placement of which the committee has not yet determined.

Figure XII shows that case I percentage cannot be effectively taught before a mental level of twelve years four months, and even then only to children who have passed a 100 percent test in multiplication of decimals. There is very little flattening of the curve at twelve years four months, although this is the point of flection, and there is considerable gain in postponement until a mental level of thirteen years one month, or even higher.

Figure XIII shows that long division has been badly misplaced in school curricula which assign it to the fourth grade. At the mental level of nine years ten months, which is approximately the fourth grade level, considerably less than half the children have a chance of making a retention test score of 80 percent in long division, even if they have made a score in simple multiplication of 100 percent, one in short division of 88 to 100 percent, and one in subtraction of 100 percent. Long division apparently should not be taught until a mental level of twelve years seven months, or well along into the sixth grade for children who are average or above in mental age.

This would be more startling were it not that the data reported above on multiplication facts and short division throw these two processes, both of which are prerequisite to an adequate mastery of long division, up to mental levels of ten years two months and eleven years four months, respectively.

Figure XIV shows the effect of varying standards of mastery, long division being used as an example. The committee arbitrarily set-

tled upon a score of 80 percent in a retention test as the lowest score that could be considered as indicating adequate mastery. Suppose the committee had established 90 percent or 100 percent as the standard, what percent of children at each mental level would have achieved it? Or suppose the standard was lowered to 70 percent, 60 percent, or even 50 percent, what would have been the result? Each of these standards is shown in Figure XIV.[10] All the curves, it will be noticed, are approxi-

Figure XIII

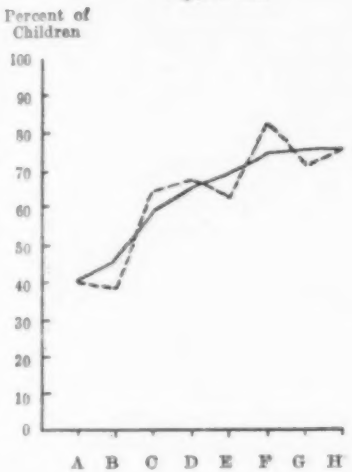

Figure XIV

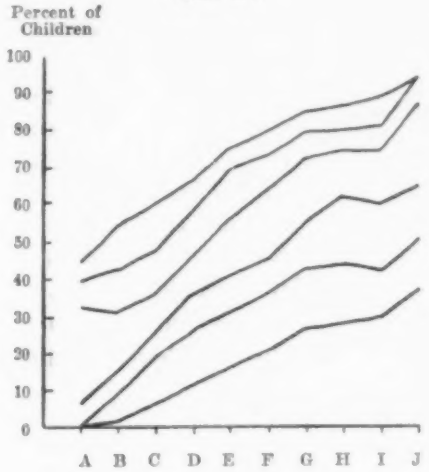

FIGURE XIII

LONG DIVISION: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING THE REQUIRED FOUNDATIONS TEST SCORES AND 80 PERCENT OR BETTER ON THE RETENTION TEST

	A	B	C	D	E	F	G	H
Mental Levels	8-11 to 9-9	9-10 to 10-5	10-6 to 11-1	11-2 to 11-9	11-10 to 12-6	12-7 to 13-4	13-5 to 14-4	14-5 to 15-4
No. of Children	10	21	45	49	52	40	14	8

FIGURE XIV

LONG DIVISION: PERCENT OF CHILDREN AT EACH MENTAL LEVEL MAKING 50, 60, 70, 80, 90 PERCENT OR BETTER, AND 100 PERCENT ON THE RETENTION TEST (Curves from Lower to Upper in Descending Order of Percents)

	A	B	C	D	E	F	G	H	I	J
Mental Levels		8-1 to 8-10	8-11 to 9-9	9-10 to 10-5	10-6 to 11-1	11-2 to 11-9	11-10 to 12-6	12-7 to 13-4	13-5 to 14-4	14-5 to 15-4
No. of Children	18	27	93	115	141	161	131	75	36	14

[10] This graph differs from the others in this article in that all children tested are included, *regardless of foundations test scores.* The effect of eliminating children with low foundations scores is to select, in the lower mental levels, the children with

mately parallel. All rise steeply to about the mental age level of eleven years ten months and then flatten out, or begin to do so. All indicate that if one raises the mastery standard, one automatically lowers the proportion of children at a given mental age that can reach it, and vice versa. *The effectiveness of postponing the teaching of a topic until the curve begins to flatten out is in no way affected by changing the standards.* The flattening of the curve is not a function of one's standard of achievement but of the mental age (and, of course, the prerequisite arithmetic knowledge) of the child.

For this reason, a study has been made of the flattening point of the curves for all topics, graphs of mean retention scores at each mental age being used.[11] Space limitation prevents reproducing these graphs in this article, but the flattening in almost all cases is definite and decisive. In the table at the close of this article, the point at which mean retention curves flatten finally to 16°[12] or less is given as the optimum mental age for the teaching of the topic.[13] In a few cases, the curves do not flatten, presumably because the committee lacks sufficient data at the higher mental age levels for these topics. In such cases, the highest mental age level is given for which the committee has data. This is followed by a plus sign to indicate that the optimum teaching time is either at this level or higher.

In consideration of all the findings presented in this article, and the much more extensive ones for which there is not space, it is the belief of the committee that a reorganization of the arithmetic curriculum in accordance with the readiness of the children for each topic will greatly

special arithmetic ability. From a practical standpoint, this is desirable; such children can be expected to undertake a process sooner than the average. But in studying the central tendencies of mental growth, the issue is clearer if foundations test scores are disregarded.

[11] As a matter of fact, the flattening point on these graphs is almost always identical with the flattening point on the curves showing the proportion of children at each mental age reaching 80 percent retention, all children, regardless of foundations test scores, being included in both types of graphs.

[12] A definite degree could be fixed because all graphs use half-sigma intervals, and are therefore comparable. Sixteen degrees was established by finding, through inspection, the minimum degree of flattening common to all curves when they flattened decisively.

[13] In the case of long division, the flattening of the curve takes place *before* the mental level at which the standard is reached; theoretically, from the standpoint of curve flattening, this process should be taught at eleven years ten months of mental age. Practically, however, since only 69 percent of the children reach the 80 percent retention score at eleven years ten months, and since the standard (75 percent) of the children have adequate (80 percent) retention at twelve years seven months, then twelve years seven months is given as both minimum and optimum mental age for long division.

reduce arithmetic failures, and will promote effective and lasting mastery of the various facts and processes of arithmetic.

CONCLUSION

There is a point in a child's mental growth before which it is not effective to teach a given process in arithmetic and after which that process can be taught reasonably effectively. The child's preceding grasp of those facts and processes that enter into the new topic he is going to study is even more important than the mental level he has reached. Through mental testing and achievement testing, a teacher can and should determine when the children in her class are ready to undertake a new process, and either through ability grouping or individual work should see that each child gets the arithmetic for which he is ready at a time when he is ready for it.

Being faced with the necessity of establishing a criterion as to what constitutes adequate mastery of an arithmetic topic, the Committee of Seven has adopted the following standard:

Adequate mastery shall be considered as that degree of mastery which enables a child to pass a retention test with adequate time limits covering all the important phases of a topic, six weeks after the conclusion of his study of that topic, with a score of 80 percent or better. A topic should not be taught to children until they have reached a mental age and a degree of mastery of prerequisite facts and processes sufficient to enable at least three-fourths of them to achieve this mastery.

This standard is used in Table I, given below, to establish the *minimum* mental age and foundations test scores that should be attained by each child before undertaking a topic. Higher or lower standards of mastery would raise or lower the mental age and foundations level indicated in this table, but probably would not, in most cases, alter the relative placement of the topics.

For the *optimum* mental age, graphs of mean retention test scores, not here reproduced, have been used. The mental age given is that at which the curve definitely flattens, i.e., beyond which there ceases to be marked gain through postponement. While reasonably satisfactory results can be obtained by teaching each topic at the minimum levels indicated, there is a decided gain in the ease, efficacy, and permanency of the learning if it is delayed (where delay is indicated) to the optimum mental age.

TABLE I

Topic	Minimum Score on Foundations Test (Percent)	Minimum Mental Age	Optimum Mental Age
Addition Facts—Sums 10 and under			
Intelligence—Haggerty, Delta I		6 yr. 5 mo.	7 yr. 4 mo.
Subtraction Facts—Easier 50			
100 Addition Facts	84		
Intelligence—Haggerty, Delta I		6 yr. 7 mo.	8 yr. 3 mo.
Addition Facts—Sums over 10			
Intelligence—Haggerty, Delta I		7 yr. 4 mo.	7 yr. 11 mo.
Subtraction Facts—Harder 50			
100 Addition Facts	96		
Intelligence—Haggerty, Delta I		7 yr. 8 mo.	8 yr. 11 mo.
Subtraction Process			
100 Addition Facts	94		
100 Subtraction Facts	57		
Intelligence—Haggerty, Delta I		8 yr. 9 mo.	8 yr. 9 mo.+
Meaning of Fractions			
Intelligence—National A 3		9 yr. 0 mo.	10 yr. 9 mo.
Addition and Subtraction of Like Fractions and Mixed Numbers with Like Fractions (No Borrowing)			
Addition Facts	96		
Subtraction Facts	97		
Meaning of Fractions	100		
Intelligence—National A 3		9 yr. 10 mo.	11 yr. 1 mo.
Multiplication Facts			
Addition Facts	92		
Intelligence—Otis Primary B		10 yr. 2 mo.	10 yr. 2 mo.
Compound Multiplication			
Column Addition	83		
Multiplication Facts	93		
Simple Multiplication	89		
Intelligence—Otis Primary B		10 yr. 4 mo.	11 yr.+
Graphs—Simple Bar		10 yr. 5 mo. (Chron. Age)	
Decimals—Additions and Subtraction			
Column Addition	100		
Subtraction	100		
Meaning of Decimals	79		
Intelligence—Otis Primary B		10 yr. 11 mo.	12 yr. 6 mo.+
Short Division			
Subtraction Facts	97		
Division Facts	89		
Intelligence—Otis Primary B		11 yr. 4 mo.	11 yr. 4 mo.+
Meaning of Fractions—Grouping*			
Intelligence—National A 3		11 yr. 7 mo.	13 yr. 4 mo.+
Case I—Percentage			
Multiplication of Decimals	100		
Intelligence—National A 3		12 yr. 4 mo.	13 yr. 11 mo.

*This involves showing ¾ of 12 objects, ⅕ of 15 objects, etc., *by inspection*, before teaching the manipulation of fractions.

TABLE I (*Continued*)

Topic	Minimum Score on Foundations Test (Percent)	Minimum Mental Age	Optimum Mental Age
Long Division			
Subtraction	100		
Simple Multiplication	100		
Short Division	88		
Intelligence—National A 3		12 yr. 7 mo.	12 yr. 7 mo.
Addition and Subtraction of Unlike Fractions and Mixed Numbers with Unlike Fractions, and Subtraction of Mixed Numbers Involving Borrowing			
Addition Facts	96		
Subtraction Facts	97		
Meaning of Fractions	100		
Intelligence—National A 3			

Whether one uses the minimum or the optimum mental age level for determining the curriculum placement of arithmetic topics, adequate foundations test scores, as shown in the following table, should always be attained by each child before he begins a new topic.

To attempt to teach a topic before either the minimum or optimum stage of mental growth is reached is not merely to waste much time and effort on the part of teacher and pupil, but to doom a considerable number of children to failure, and a much larger number to that hazy half knowledge, so characteristic of children's grasp of arithmetic and so inimical to the clear thinking and sure-footed progress that should characterize the study of mathematics.

THE SELECTIVITY OF THE PHILADELPHIA CENTRAL HIGH SCHOOL (1846-1865) AND THE HARTFORD PUBLIC HIGH SCHOOL (1848-1865)

A. Clyde Schock
Philadelphia Central High School

A number of investigations have been made of the democracy of the American public high school. The best known of these is recorded by Counts in *The Selective Character of American Secondary Education*,[1] which indicates that in 1920 the American public high school in large cities was a selective institution in which the children of the professional and upper economic groups constituted the large majority of the school population.

These investigations raise the questions: Has the economic status of the American high-school pupils, as represented by the occupations of their parents, been a continuous factor in selectivity? Has the degree to which this factor operated changed in the century of high-school history? Has this factor operated to the same degree in different cities of the United States?

Following the method of procedure indicated in Counts' investigation, two high schools are chosen for this study because of the continuity of their history, the availability of the pertinent data and the diversity of geographic location: The Philadelphia Central High School, established in 1838, and the Hartford Public High School, established in 1847. As the information for the Hartford High School is readily accessible for the period of 1848-1865, the information for the Central High School is limited to the interval 1846-1865. This makes possible a comparison of the degree of selectivity present in the high schools of the two cities at practically identical times.

The sources of the collected data are the Annual Reports of the Controller of Public Schools in the County of Philadelphia and a manuscript copy of portions of the Hartford Public High School Register. This manuscript was made for Dr. E. D. Grizzell, Professor of Secondary Education, University of Pennsylvania, who kindly permits its use for this investigation.

There is a question of the reliability of the information obtained from the Hartford Public High School Register. The manuscript copy gives

[1] Counts, G. S. *The Selective Character of American Secondary Education* (Chicago: University of Chicago Press, 1922), p. 37.

the occupations of the parents of 117 pupils for the year 1847—1848, while Hertzler[2] reports the occupations of the parents of 90 pupils. This discrepancy may be due to the fact that Hertzler[3] begins his yearly tabulation on December 6, 1847, while the manuscript list, no doubt, begins with the opening of school in September, 1847. Hertzler makes the following comment concerning these data:

> One word of caution must be stated concerning the Hartford figures; however, for no record of the occupations of the parents was given for a very large number of students.[4]

The manuscript copy is considered the best available source of data and consequently is used in this investigation.

In the reports of the Controller of Public Schools of Philadelphia, the information about the pupils entering the Central High School is given in two ways. First, there is a list of students, giving, among other facts, the occupations of their parents; then, there is a summary of the parents according to occupations. There are inaccuracies in these summaries, but the lists are complete, since the only omission, the information about John Franklin Hagey,[5] a student of 1860, is secured from another source.[6] Consequently, for the purposes of this study, the lists are used although this required their resummarization.

The 143 various occupations of the Hartford parents and the 240 of the Philadelphia parents are classified into the occupational groups given by G. S. Counts[7] with the exception of the Artisan—proprietors division and the addition of a Gentlemen, Gentlewomen division. The Artisan—proprietor division, which consists of those artisans who own the shops in which they work, is omitted because of the indefiniteness of the source material. For example, there is no way to decide whether a saw maker was a skilled artisan, a proprietor of a small shop, or the owner of a nationally known Philadelphia saw factory. As a result of this

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[2] Hertzler, S. *The Rise of the Public High School in Connecticut*, (Baltimore: Warwick & York, Inc., 1930), p. 191.

[3] *Ibid.*, 188.

[4] *Ibid.*, 190.

[5] The Annual Report of the Controller of Public Schools in the County of Philadelphia, No. 42 (1860), p. 189.

[6] Brecht, S. K. *The Genealogical Record of the Schwenkfelder Families*, (New York: Rand McNally & Co., 1923), p. 1266.

[7] Counts, G. S. *The Selective Character of American Secondary Education*, (Chicago: University of Chicago Press, 1922), pp. 22-23.

omission of the Artisan—proprietor division, the miscellaneous trades division is proportionately larger. This fact should be given consideration in interpreting the results. Furthermore, the large number of gentlemen and gentlewomen, reported in both cities, necessitates the separate division for them in the classification.

Tables I and II are formed from the yearly lists of occupations, distributed according to the classification just described and combined into four groups of five years each, with the exception of the first group of the Hartford High School. A given date represents the entire school year during which the first of January of that date occurred; i.e., 1848 represents the school year from September 1847 to June, 1848.

In order to investigate thoroughly the question of selectivity, consideration should be given to the ratio of the number of pupils whose parents are in each occupational division to the total number of persons gainfully employed in that division. Unfortunately, none of the United States census reports of this period gives any information about the occupations of Hartford, and the earliest to mention the occupations of Philadelphia is the ninth census of 1870. According to this census,[8]

TABLE I

THE OCCUPATIONS, BY NUMBER AND PERCENTAGE, OF THE PARENTS OF 4,980 PUPILS WHO ENTERED THE PHILADELPHIA CENTRAL HIGH SCHOOL, 1846-1865

	Number				Percentage			
	1846–50	1851–55	1856–60	1861–65	1846–50	1851–55	1856–60	1861–65
Proprietors	314	321	380	406	28.4	27.6	29.6	28.5
Professional service	103	106	100	111	9.3	9.1	7.8	7.8
Managerial service	2	7	14	45	0.2	0.6	1.1	3.2
Commercial service	9	14	28	46	0.8	1.2	2.2	3.2
Clerical service	61	81	93	123	5.5	6.9	7.2	8.6
Agricultural service	32	21	34	31	2.9	1.8	2.7	2.2
Building trades	105	121	115	130	9.5	10.4	9.0	9.1
Machine trades	52	69	72	79	4.7	5.9	5.6	5.5
Printing trades	30	31	38	28	2.7	2.6	3.0	2.0
Miscellaneous trades	268	293	289	259	24.3	25.2	22.5	18.2
Transportation service	22	28	22	20	2.0	2.4	1.7	1.4
Public service	3	2	7	18	0.3	0.1	0.6	1.3
Personal service	1	8	9	10	0.1	0.7	0.7	0.7
Miners, Lumbermen, etc.	6	12	3	4	0.5	1.0	0.2	0.3
Common labor	16	22	21	12	1.5	1.9	1.6	0.8
Gentlemen, Gentlewomen	81	31	58	103	7.3	2.6	4.5	7.2
Total	1105	1167	1283	1425	100.0	100.0	100.0	100.0

[8] The Ninth Census of the United States, 1870 (Washington: Government Printing Office, 1872), Vol. 1, p. 794.

202,127 persons, between the ages of 16 and 59, were gainfully employed, and 174,539 of these are distributed among a list of 69 selected occupations. This difference of 27,588 represents persons engaged in a large

TABLE II

THE OCCUPATIONS, BY NUMBER AND PERCENTAGE, OF THE PARENTS OF 1,983 PUPILS WHO ENTERED THE HARTFORD PUBLIC HIGH SCHOOL, 1848-1865

	Number				Percentage			
	1848 – 50	1851 – 55	1856 – 60	1861 – 65	1848 – 50	1851 – 55	1856 – 60	1861 – 65
Proprietors	136	116	116	115	29.4	23.7	20.2	25.2
Professional service	51	57	79	53	11.0	11.7	13.8	11.6
Managerial service	11	19	21	28	2.4	3.9	3.7	6.2
Commercial service	8	5	7	20	1.7	1.0	1.2	4.4
Clerical service	34	27	28	14	7.3	5.5	4.9	3.1
Agricultural service	34	32	57	32	7.3	6.6	9.9	7.0
Building trades	41	46	55	43	8.8	9.4	9.6	9.4
Machine trades	10	31	32	32	2.1	6.4	5.6	7.0
Printing trades	10	15	25	11	2.1	3.1	4.3	2.4
Miscellaneous trades	53	52	65	64	11.5	10.6	11.3	14.0
Transportation service	13	9	9	8	2.8	1.8	1.6	1.8
Public service	1	0	0	3	0.2	0.0	0.0	0.7
Personal service	5	0	7	5	1.1	0.0	1.2	1.1
Miners, Lumbermen, etc.	0	0	0	0	0.0	0.0	0.0	0.0
Common labor	2	5	7	6	0.4	1.0	1.2	1.3
Gentlemen, Gentlewomen	55	75	66	22	11.9	15.3	11.5	4.8
Total	464	489	574	456	100.0	100.0	100.0	100.0

TABLE III

A COMPARISON OF THE NUMBER OF PUPILS ENTERING THE PHILADELPHIA CENTRAL HIGH SCHOOL, 1861-1865, WHOSE PARENTS ARE IN EACH OCCUPATIONAL GROUP, WITH THE NUMBER OF PERSONS ENGAGED IN THESE OCCUPATIONS IN PHILADELPHIA, IN 1870

	Number of Persons	Number of Pupils	Number of Pupils per 10,000 Persons
Proprietors	21,253	406	191
Professional service	5,178	111	214
Managerial service	3,975	45	113
Commercial and Clerical service	16,334	169	103
Agricultural service	3,845	31	81
Building trades	19,814	130	66
Machine trades	11,124	79	71
Printing trades	3,608	28	78
Miscellaneous trades	52,956	259	49
Transportation service	7,353	20	27
Public service	2,633	18	68
Personal service	28,853	10	3
Miners, Lumbermen, etc.	896	4	45
Common labor	24,310	12	5
Total	202,127	1,322	65

TABLE IV

PERCENTAGES OF PUPILS FROM AGGREGATIONS OF OCCUPATIONAL GROUPS, IN THE ENTRANCE CLASSES OF THE PHILADELPHIA CENTRAL HIGH SCHOOL (1846-1865) AND THE HARTFORD PUBLIC HIGH SCHOOL, (1848-1865); AND IN THE FRESHMAN YEAR OF FOUR CITIES SELECTED BY G. S. COUNTS (1920)

	Philadelphia				Hartford			Four Cities
	1846-50	1851-55	1856-60	1861-65	1848-50	1851-55	1856-60	1861-65	1920
Proprietor, Professional, Managerial, Commercial and Clerical service	44.2	45.4	47.9	51.3	51.8	45.8	43.8	50.5	55.8
Trades	41.2	44.1	40.1	34.8	24.5	29.5	30.8	32.8	27.8
Common labor and Personal service	1.6	2.6	2.3	1.5	1.5	1.0	2.4	2.4	3.2
Other Occupations	13.0	7.9	9.7	12.4	22.2	23.7	23.0	14.3	14.2
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

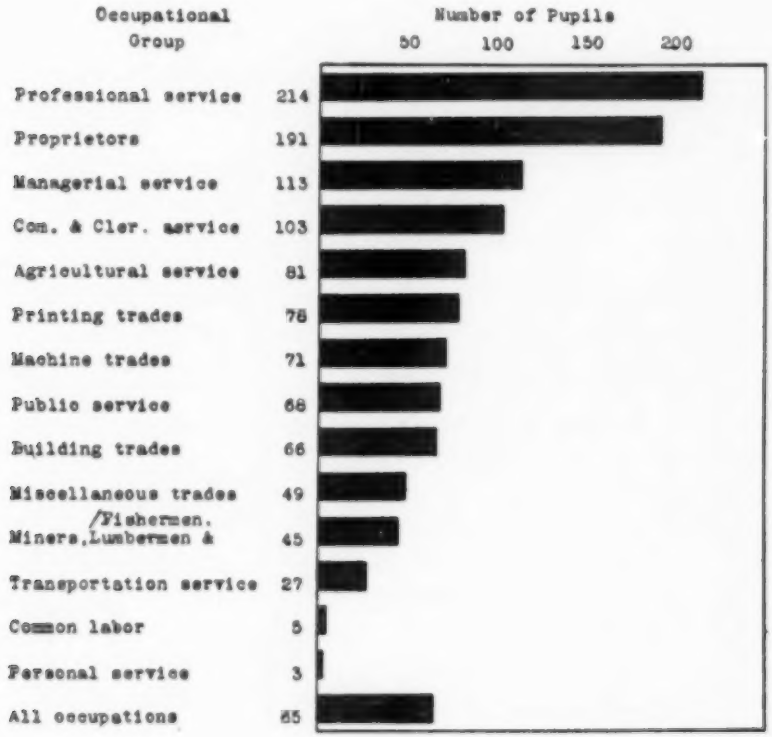


FIGURE I

THE NUMBER OF PUPILS ENTERING THE CENTRAL HIGH SCHOOL OF PHILADELPHIA, 1861-1865, FROM EACH OCCUPATIONAL GROUP, FOR EVERY 10,000 PERSONS ENGAGED IN THAT OCCUPATION, IN PHILADELPHIA, IN 1870.

number of numerically unimportant occupations. It is assumed that these 27,588 are distributed proportionally among the occupational groups. This permits the approximate classification of the 202,127 employed persons into the occupational groups of Table III. Owing to the character of the Census data, the commercial service and the clerical service groups are combined, and the gentlemen, gentlewomen group are omitted, making the fourteen occupational groups for Table III. The conclusions of Table III are graphically illustrated in Figure I.

Tables I and II show that for the twenty years under consideration, 1846-1865, there was little variation in the proportional representation of the various occupational groups in the high-school population. These tables also show that the proportional occupational representations for the high schools of Hartford and Philadelphia were quite similar, with the exception of the greater percentage of gentlemen and gentlewomen in Hartford for which compensation is shown in the increased percentage of miscellaneous trades in Philadelphia. This variation can be interpreted as the reflection in the schools of the general economic and social conditions of the community in which they are located. Furthermore, it is seen from Table IV, which is a condensation of Tables I and II, that the children whose parents were of the professional and higher economic classes comprised about one-half of the school population. When these results are compared with those of a similar investigation, by G. S. Counts[9] in 1920, of the occupational status of the pupils in the freshman classes of the high schools of four selected cities, there is definite evidence that social and economic conditions have been a continuous factor in the selectivity of the American public high school in large cities. Table III and Figure I give further and conclusive evidence of the degree of selectivity in the Central High School of Philadelphia, from 1861-1865.

[9] Counts, G. S. *The Selective Character of American Secondary Education*, (Chicago: University of Chicago Press, 1922), p. 37.

SHORTER ARTICLES

A NEW TYPE OF MOTIVATION CHART

A. K. KURTZ
U. S. Civil Service Commission

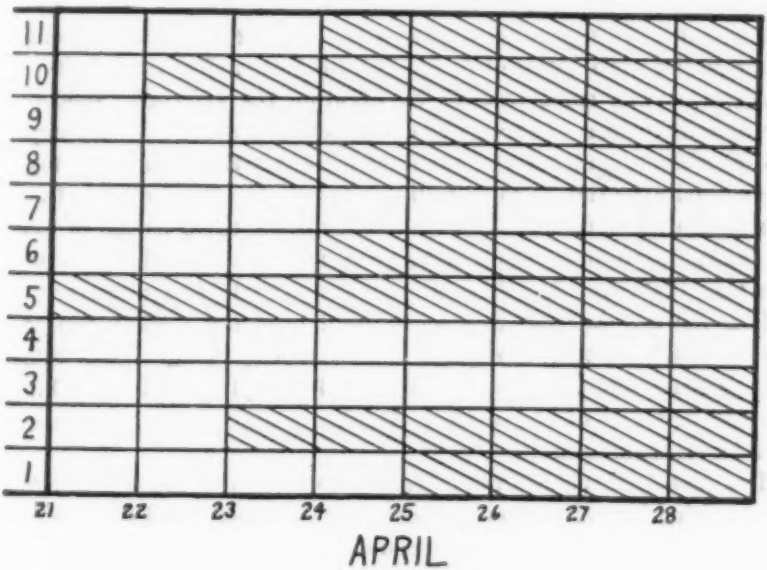
WHEN a number of discrete items of unequal difficulty are to be learned or achieved and when the items may be accomplished in any order, the ordinary type of learning curve will not suffice, since it will show only the total number of items learned and will not give any information with respect to which items have been accomplished and which have not. The accompanying chart aims to obviate this difficulty. It can be used with any number of items and the items may be either dependent on each other or entirely unrelated. An example of the latter type of items is a list of things that a person resolves to do during a given period of time.

Two restrictions must be made, however, with respect to the types of items for which this chart is applicable. The item must be of the type that, when once accomplished, stays accomplished. That is, if item 1 is accomplished on April 25, it must be possible on any later day to say that item 1 has been accomplished. This would, obviously, not be true, or at the most be true only in a trivial sense, of such items as learning the multiplication table or memorizing a poem, because in such instances forgetting begins so soon, and the fact that a person once knew the answer to "7 times 8" is of little consequence if the answer is not known now. A second restriction upon the class of items is that there must be some criterion of accomplishment or some arbitrary degree of proficiency which the subject can determine in advance and which he can recognize when he has attained it. Thus, "Run rapidly" could not be considered as an item to be accomplished, but "Run 100 yards in 10 seconds" could be so considered. A few other items that could be used are (1) reading a given book, (2) preparing a report, (3) attaining (not necessarily maintaining) a certain proficiency in juggling, (4) shooting fifteen consecutive bull's-eyes, (5) accomplishing any feat, and (6) solving a difficult problem of any sort.

The items to be learned are arranged in any convenient order along the vertical axis, each item corresponding to an area across the chart between ruled parallel lines. Time (usually expressed as successive days in one or more months) is given on the horizontal axis, each day corre-

sponding to a vertical line. Whenever a given item is accomplished, the subject takes a pencil and fills in the space in the area allotted to that item from the line corresponding to the day on which it is achieved to the right edge of the chart. Thus, on the accompanying chart, the subject accomplished item 5 on April 21 (the first day), item 10 on April 22, items 2 and 8 on April 23, etc. Note that by glancing along any vertical line such as April 27, we can see (1) that items 1, 2, 5, 6, 8, 9, 10, and 11 had been achieved at the beginning of that day; (2) that items 3, 4, and 7 had not been achieved at the beginning of that day; (3) that item 3 was accomplished on that day; (4) that items 1, 2, 3, 5, 6, 8, 9, 10, and 11 had been achieved at the end of that day; and (5) that items 4 and 7 had not been achieved at the end of that day.

A New Type of Motivation Chart



Note that if the items are accomplished in regular order (as in reading the chapters of a book), the line connecting successive points on the boundary of the black and white areas is the same line that is obtained in the ordinary learning curve.

REDUCING FAILURES BY A PLAN OF ALTERNATIVE DISMISSAL
HOLDING FAILING PUPILS FOR ADDITIONAL INSTRUCTION

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THE failure problem in high schools has led to numerous trials in providing special attention for pupils who are dull. Favorable results have been secured from certain methods such as ability grouping, special classes, and the employment of additional teachers; yet schools must be operated within their own limitations and many administrators find it impossible to provide extra teachers, special classes, or other equally desirable factors. Hence, the field is open for further experiment. Norwin High School, Irwin, Pennsylvania, has tried a plan involving alternative dismissal. This experiment was conducted through April and May, 1929, during which time passing pupils were dismissed at 3:00 o'clock and failing pupils were detained for additional instruction until 3:40. This arrangement was made possible by dividing the afternoon session into four periods instead of three. The regular program was thus completed at 3:00 o'clock, and for the remainder of the school day the teachers gave special attention to their failing pupils. In other words, afternoon classes were made shorter in order to provide an extra period of instruction for failing pupils; the benefits accruing to these pupils were derived from time that was taken from pupils who were doing satisfactory work.

It is not our purpose to discuss the details and possibilities of this plan or to report upon the pupil reaction to it, though much could be said. Rather, our purpose is to report the results obtained. Data are provided in terms of the number of failures and of the average attainment for different groups.

The school in which this experiment was conducted is a joint high school with 22 teachers and an enrollment of 540 pupils. The pupils come from small towns, villages, country and mining communities, and from grade schools of every description without uniform supervision except as provided by the County Superintendent who serves a pupil population of approximately 60,000. Preparation for high school entrance covers a wide range, and I Q's group themselves into a normal distribution; throughout the population are scattered about 100 second-generation pupils. The school is located 20 miles from Pittsburgh; the community is classified as urban residential, and the East Pittsburgh

industrial works eventually employ half the pupils, graduates and non-graduates.

First, we shall observe the school's failure record. Results for January are compared with results for May, these months corresponding as report periods in their respective semesters. Table I gives the data.

TABLE I

COMPARISON OF FAILURES FOR JANUARY AND MAY

	Number of Failing Marks	Number of Failing Pupils
January	261	154
May	201	126
Difference	60	28

From Table I we see that the January report, representing regulation conditions, contained 261 failing marks, distributed among 154 pupils; and the May report, representing the period of alternative dismissal, revealed 201 failing marks, distributed among 126 pupils. Here we find 60 less failing marks in May than in January, and 28 less failing pupils.

The trend in failure between January and May is shown in Table II, which contains the data on failures included in all of the reports issued from January to May, inclusive.

TABLE II

COMPLETE DATA ON FAILURES, JANUARY TO MAY

	Number of Failing Marks	Number of Failing Pupils
January	261	154
March	278	169
*April	286	178
May	201	126

*Issued the first week in April, after alternative dismissal had been in effect only several days.

In Table II, the trend of failure is upward until May—the period of alternative dismissal—when the number of failing pupils decreased significantly. According to figures of the January, March, and April reports, failures would seem to have been cumulative, perhaps contagious; and the only prediction we could make for May under regulation conditions would be the usual proportional increase, giving a possible total of 185. With the changed conditions we find 126, which represents not only an arrest of the trend but also a complete reversal in direction. This, the table shows definitely. It does not indicate, however, the full significance of the situation. Failure becomes more or less a question of morale. Often it indicates that the pupil has not set a high standard for himself, that the standard talked about by his teachers

and his parents is to him a goal which he does not believe in or care to achieve. To save such a pupil, we need, first, to change his mind, a difficult thing to do with many high-school pupils in the short period of time allotted to this experiment. And then we need to get him to work, which is also difficult after he has shirked for several months. We know that out of 178 such pupils who were failing in early April, 52 were passing in May—after the experimental factor had been sufficiently applied. Now, can this improvement be credited entirely to the conditions prescribed by alternative dismissal? In support of an affirmative reply, we have (1) a direct comparison between two report periods that are related as to their semester position, and (2) a trend picture, both favoring alternative dismissal. Moreover, we find no irrelevant conditioning factors to which the improvement may be ascribed.

For the purpose of evaluating differences in average attainment, we shall deal with data for three groups: (1) failing pupils; (2) passing pupils; and (3) the whole school. The average attainment of each of these groups, during the operation of alternative dismissal, is to be compared with its average attainment before this experimental factor was applied. Again, results for May are compared with results for January. In experimental terms, January results represent IT, May results, FT, and alternative dismissal is EF. The initial test, final test, and experimental factor will be applied in the one-group type of experimental method, the application being made for each of the three groups mentioned above. Strictly speaking, there are two experimental factors: the alternative dismissal program and the regulation program. But inasmuch as the regulation program was our starting point, its results may be substituted for IT; while the results for the period of alternative dismissal may be used for FT. Their difference—the change produced by alternative dismissal—is the object of our concern. The usual statistical technique for determining reliability, comparing groups, and testing conclusions will be employed. Pupils' marks are taken as the unit measure of attainment, and from these our averages were determined.

Data for the failing group,[1] from correlated measures, are set forth in Table III.

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[1] The personnel of this group was determined from the January report, wherein they were below grade in one or more studies.

TABLE III

AVERAGE ATTAINMENT FOR JANUARY AND MAY (FAILING GROUP)

	January	May	Difference
Average Attainment	78.17 ± .45	79.33 ± .60	1.16 ± .58
Standard Deviation	3.95 ± .33	5.25 ± .43	1.30 ± .42
Correlation	.43		

The obtained difference in average attainment is, we find, 1.16 with a standard error of .58; this difference favors the May report. It is not large enough to be regarded as "significant." The obtained difference divided by its standard error is 2 sigma which may be interpreted to mean that the chances are 95 to 100 that these differences may not have arisen because of sampling fluctuations. Taken as a group, then, those who were failing before the inauguration of alternative dismissal may be expected to improve in average attainment under its conditions.

Another difference contained in Table III, that of variability as indicated by the standard deviations, must be considered. This obtained difference divided by its standard error is 3.09 which means that it is practically certain that the "spread" of scores for members of the failing group will be greater with alternative dismissal. This evidence strengthens a prediction that they will not continue to hang together as brothers in failure; but we have no assurance that all, or even a majority, will advance to the passing group. To predict this happy conclusion, we would have to find a low variation attending a significant gain in average attainment. We find just the opposite. The mean gain, 41 out of 157, calculated from Table II is, no doubt, as much as we could predict for another trial of our plan under similar conditions.

So far, we have found a measure of success for alternative dismissal. The failing group has gained, and we know how much.

What of the passing group?[2] Table IV furnishes the answer to this question.

TABLE IV

AVERAGE ATTAINMENT FOR JANUARY AND MAY (PASSING GROUP)

	January	May	Difference
Average Attainment	86.39 ± .47	85.34 ± .54	1.05 ± .19
Standard Deviation	4.00 ± .33	4.60 ± .38	.60 ± .13
Correlation	.94		

In Table IV we find that the pupils who were passing in January lost in average attainment for the period of alternative dismissal. These people were rewarded for "satisfactory" work by being dismissed 40

[2] Determined from the January report.

minutes early, and the results show that their loss was statistically significant. The change in variability is also significant. These two significant changes are explained by the high coefficient of correlation (.94). The higher the correlation, the lower the standard error of the difference; hence the greater the significance of the difference. The high correlation here also tells us that the members of the passing group went down together. Thus it is quite evident that alternative dismissal, with its shorter afternoon periods, was not a good thing for pupils who constituted the passing group.

Results for the school as a whole are presented in Table V.

TABLE V

AVERAGE ATTAINMENT FOR JANUARY AND MAY (WHOLE SCHOOL)

	January	May	Difference
Average Attainment	85.06 ± .70	84.95 ± .78	.11 ± .49
Standard Deviation	4.93 ± .50	5.45 ± .55	.52 ± .35
Correlation	.78		

The difference in May for the whole school is not significant, either in average attainment or in variability. Going into the table of probability integrals, we find the chances, 6 out of 10, that May averages will be lower than January averages, but not much lower. The May loss, necessary to cause alarm as to the best interests of the whole school, would have to be represented by an obtained difference in the averages of 1.47 (3 times .49), whereas it is only .11.

TABLE VI

SUMMARY

	Failing Group	Passing Group	Whole School
Increase in Average Attainment (May over Jan.)	1.16 ± .58		
Decrease in Average Attainment (May over Jan.)		1.05 ± .19	.11 ± .49
Increase in Standard Deviation (May over Jan.)	1.30 ± .42	.60 ± .13	.52 ± .35
Correlation	.43	.94	.78

The obtained differences in this report are small, as shown in Table VI; but this is no indication that they are of small importance, for their standard errors which are also small denominate their significance. The obtained differences, however small, furnish grounds for predicting what will happen in the future. In the case of passing pupils, with differences that are significant and a correlation coefficient that is high, we shall not hesitate to predict that losses in average attainment will recur with this plan in effect. For failing pupils, however, we cannot predict with a large degree of certainty as to average attainment; it may be higher or lower. But we are certain that some pupils who would other-

wise fail will find themselves and do successful work under this plan that provides special attention for them.

The findings of this study indicate that the plan herein set forth would not be justified for year-round school. It is a good spring tonic for "flunkers."

THE PERSISTENCE OF CERTAIN PERSONAL ATTITUDES IN YOUNGER ADOLESCENT BOYS

LENNIG SWEET
Y. M. C. A., Peiping, China

DURING the past two years, the writer has spent a great deal of time experimenting with and revising a self-administering paper-and-pencil attitudes test for boys twelve to fourteen years of age, one form of which is used for all three ages. The purpose of this test is to enable club leaders and classroom teachers to discover the boys who are likely to possess behavior and emotional problems and to evaluate through the use of this instrument the results of the supposedly character-building programs.

The test purports to measure the following seven categories: (1) criticism of self, (2) criticism of the average boy, (3) feeling of difference from the average boy, (4) superiority, (5) inferiority, (6) deviation from the accepted idea of the right, and (7) social insight.

The general nature of the test, its reliability, and its validity are fully reported elsewhere.[1]

The general conclusions of the previous investigation are that this test is as reliable as the average test used in the schoolroom, and reliable as a test of character. This investigation also showed the test to be an instrument by which many boys will reveal their character traits. This is true not only of the attitudes directly measured by the test, but also of such traits as honesty, popularity, coöperation, etc.[2]

There remained the question, however, as to whether or not the test, which had been shown to be highly reliable when the self-r's were obtained, would also prove reliable on a retest. If it would not, it would be of little use in evaluating programs of character education.

[1] Sweet, Lennig. *The Measurement of Personal Attitudes in Younger Boys.* (New York: Association Press, 1929), 57 pages. The test is also on sale by the Association Press, 347 Madison Avenue, New York City, under the title of "Personal Attitudes Test for Younger Boys."

[2] Ibid, p. 50.

Our investigation as to the reliability of the test, when twice administered with an intervening period of two weeks, is reported below. Although the experiment did not cover a long period of time, it is believed that the study has added another criterion to show the test to be a fairly reliable instrument for group testing, and that some of the by-products of this phase of the study are also significant.

For the purpose of this study, a group of 114 boys was chosen, to whom the test was administered twice with an intervening period of two weeks.[3] This group consisted of boys between the ages of twelve and fourteen, inclusive. They were pupils in a large urban junior high school drawing from the higher economic levels. As the test requires a subject to make a total of 780 decisions, and as these are usually completed in about twenty-five minutes (or at the rate of one every two seconds), it was felt that the period of two weeks between testings was long enough to make it impossible for a boy to remember enough of his 780 replies so as to affect his score materially.

After the tests were scored, the self-r's of both these testings were obtained, with the exception of social insight and deviation from the accepted idea of the right. These two categories are scored by means of stencils, and the obtaining of the self-r's would have entailed a great deal of additional labor. As will be seen by comparing Table I, which shows reliabilities obtained for other groups, and Table II, which shows the reliabilities for the 114 boys under consideration, the reliabilities in the first five categories in both tables are very similar. Therefore, this additional work in the case of social insight and deviation from the accepted idea of the right did not seem to be necessary.

TABLE I

SHOWING THE AVERAGE SELF-R FOR THE VARIOUS CATEGORIES MEASURED BY THE PERSONAL ATTITUDES TEST FOR YOUNGER BOYS

	Total Number In the 4 groups	Average self-r for the 4 groups	Range of self-r in the 4 groups
Self Criticism	328	.914	.886/.940
Criticism of Average Boy	306	.939	.921/.950
Feeling of Difference	384	.935	.899/.965
Superiority	375	.936	.913/.949
Inferiority	382	.785	.737/.875
Deviation from Accepted Idea of the Right	354	.885	.840/.930
Social insight	337	.870	.793/.924

NOTE: These averages are the means of the reliabilities in each category for four varying groups of boys selected at random from 9 groups totalling 959 boys. The number in each separate group ranged from 55 to 136.

[3] This experiment was made possible through the courtesy of Dr. S. A. Courtis; the test was administered under the general direction of Dr. Paul T. Rankin of the Detroit Public Schools.

The reliabilities for the group of 114 boys under discussion are shown in Table II.

TABLE II

SHOWING THE RELIABILITIES (SELF-R'S) IN THE FIRST FIVE CATEGORIES OF THE PERSONAL ATTITUDES TEST WHEN ADMINISTERED TO 114 TWELVE TO FOURTEEN YEAR OLD BOYS TWICE WITH AN INTERVAL OF TWO WEEKS

	A self-r	B self-r
Criticism of Self	.813 ± .022	.915 ± .012
Criticism of Others	.925 ± .095	.970 ± .005
Superiority	.935 ± .008	.957 ± .005
Inferiority	.864 ± .017	.890 ± .014
Difference	.908 ± .012	.980 ± .003

NOTE: The first administration is indicated by "A;" the second by "B."

It is an interesting fact that in every category the reliability of the test, as measured by dividing the instrument into its odd and even items and then applying the Spearman Prophecy Formula, is considerably greater on the re-test than on the original. It would appear that a tendency was brought out more clearly and consistently by the necessity of the subjects having to repeat a task which this second time must have been more or less irksome.

The next procedure was to obtain the correlation between the two applications of the test, by using the formula:[4]

$$r = \frac{\text{Mn AB} - (\text{Mn}_A \times \text{Mn}_B)}{(\text{Mn A}^2 - [\text{Mn A}]^2)\ (\text{Mn B}^2 - [\text{Mn B}]^2)}$$

Here, although considerable degree of relationship was discernable, it was not high enough for the scores to have much predictive value for individuals. The range of reliabilities uncorrected for attenuation was from .596 in the case of self-criticism to .801 in the case of feeling of difference. Correlations between the scores of the whole group of 114 boys for the two testings, is shown in Table III.

TABLE III

SHOWING CORRELATIONS BETWEEN THE FIRST ADMINISTRATION OF THE TEST (A) AND THE SECOND ADMINISTRATION (B)

	N	r_{AB}
Self-Criticism	114	.596 ± .041
Criticism of Others	114	.727 ± .031
Superiority	114	.780 ± .025
Inferiority	114	.599 ± .041
Difference	114	.801 ± .023
Social Insight	114	.735 ± .029
Deviation from the Accepted Idea of the Right	114	.720 ± .031

[4] Watson, Goodwin. *Experimentation and Measurement in Religious Education.* (New York: Association Press, 1927), p. 203.

It is perhaps noteworthy that the least consistency was shown when the boy was comparing himself with how he ought to feel, his ideal, and the most consistency when he compared himself with other boys.

Careful examination showed that there was a very small number of boys (between 1.5 percent and 4.5 percent of the total, according to the category) who were exceedingly inconsistent and unstable in the scores on the two testings.

In the case of an intelligence test, it would not have been justifiable to eliminate these inconsistent scores. That the same thing is not true of such a test as we are considering is, of course, an unproved hypothesis. It would seem, however, that perhaps these few boys with inconsistent scores may be especially unstable, in reality very different from the general run of lads. Whether or not this is so, we had no opportunity to discern. We did feel justified, however, in eliminating them and reporting the correlations of the two testings with this small minority eliminated.

Altogether, a total of 14 different boys were eliminated from the various categories on account of inconsistency. This elimination was entirely arbitrary, boys with greatly differing scores on the two testings being eliminated.

Of the fourteen boys, six were eliminated in one category only, five were eliminated in two, one in three, and one in four. Thus it would seem that, with the possible exception of two boys, these individuals are not consistently unstable boys in all categories, although close examination of their scores showed them varying considerably in all categories on the two testings. To determine whether or not their extreme inconsistency in a single category is significant of an important emotional reaction, or whether such inconsistencies are due to the imperfection of the test, further investigation, probably by a trained psychiatrist, would be necessary. In regard to the test this much, however, may be stated: the overwhelming majority of the boys reacted in such a manner as to give a fair degree of correlation between the two testings. That is, their reactions to the test remained fairly constant. The correlations were very materially raised by the elimination of from 1.5 percent to 4.5 percent of the most inconsistent cases. The correlations of the whole group have been shown in Table III; the correlations with the few unstable boys eliminated are shown in Table IV.

TABLE IV

SHOWING CORRELATIONS BETWEEN FIRST ADMINISTRATION OF THE TEST (A), AND THE SECOND ADMINISTRATION (B) WHEN THE SCORES OF CERTAIN INCONSISTENT BOYS HAD BEEN ELIMINATED

	Total Number Tested	Number of Inconsistent Boys	Number Scores Correlated Table IV	r_{AB}
Self-Criticism	114	5	109	.710 ± .032
Criticism of Others	114	3	111	.800 ± .023
Superiority	114	4	110	.827 ± .021
Inferiority	114	4	110	.715 ± .031
Difference	114	4	110	.866 ± .017
Social Insight	114	2	112	.796 ± .023
Deviation from the Accepted Idea of the Right	114	2	112	.765 ± .027

SUMMARY

When the Personal Attitudes Test was administered twice to 114 junior high-school boys 12 to 14 years of age, with one exception the self-r's of this group came within the range established by taking the self-r's of four other groups of similar age. The exception was a correlation of .813 in self-criticism for the subjects of the present study, as against .886 for the lowest of the four other groups.

The self-correlation of the retest was in every case higher than that of the first testing.

The range of correlation between the two testings of the various categories measured by the test was from .596 ± .041 to .801 ± .023.

When a very small number, 1.5 percent to 4.5 percent, according to the category, of the most inconsistent boys were eliminated, the range of correlations rose from .700 ± .032 to .866 ± .017.

We can thus conclude that the majority of the boys showed a high persistence of reactions measured by the test over a period of at least two weeks.

The steadiness of emotional reaction was less when judging one's own feeling in relation to the ideal than when judging one's feeling of difference from "most boys," or when judging most boys in relation to the ideal. That is, criticism of self was less consistent than criticism of others.

The investigation yielded correlations which show that here we have an instrument which is reliable as a group test in the field of character measurement.

EDITORIALS

TEACHER EDUCATION

We who live near a college campus, especially if we have children of college age, frequently find we are candidates for the M. V. (Mid-Victorian) degree because we often use a word or phrase which is out of date. It may have been just right last year, but this year a new one has taken its place.

Sometimes we feel that this is the peculiar trait of college students—this coinage of words or meaning for old ones. But a bit of reflection will show that it occurs elsewhere. For a long time those who bought and sold houses and lands were real estate dealers, but now (unless I am M. V.) they are realtors.

I note that school people are very much like the rest of humanity. We may or may not change our practices or our ideas but we change our terminology. Once we spoke of practice teaching, then of student teaching, now we have several different terms to apply to that activity engaged in by students under the guidance and supervision of experienced teachers as they attempt to learn some of the techniques of teaching before going into service with full responsibility. Perhaps we have more clearly defined the activity by our new name and perhaps not. Each inevitably reads into the term he uses the connotation determined by his own experiences, ideals and philosophy.

So too with *teacher education* which seems to be supplanting *teacher training*. Inferentially we are saying that we now recognize that teachers must be educated, must have knowledge if not wisdom; that *training* has too narrow a meaning, pertaining only to the development of skills, tricks of the trade; that what we have been doing in normal schools, teacher's colleges and schools of education all this time has been this narrow, formal, non-educative thing; but now, now we are embarking on the glorious procedure of educating teachers. I wonder! Did any one actually engaged in the preparation of teachers ever doubt that teachers needed breadth and depth of knowledge? Have the men and women in charge of the work in our great teacher training institutions ever failed

to impress upon their students that they could not hope to teach that which they did not know? I doubt it.

Of course we should strive to think clearly, to express ourselves concisely, to work constructively. The educational weal or woe of the children of the next few years will be determined by the teachers now in preparation. But the results will not be determined by the name we apply to our activity, nor is our activity likely to be modified greatly by a change of name.

What is far more important is knowledge of the best materials, methods, sequence, organization, activities, etc. to be used in the preparation of teachers. We need such knowledge based upon careful experimentation, set up and carried out in a scientific manner. We need criteria tested in the crucible of experience by which to judge our results. We need the enthusiasm and devotion of evangelists, guided and controlled by the scientific spirit.

When our program is so guided and directed, it matters little what name we use.

E. J. Ashbaugh

REVIEWS

Address all communications relative to book reviews to Editor E. J. Ashbaugh, Miami University, Oxford, Ohio.

OKTAVEC, FRANK L. *The Professional Education of Men Teachers of Physical Education in Prussia.* New York: Columbia University, 1929. vi + 112 pp.

A study of the historical and comparative development of physical education in Prussia with special emphasis on the work of the Prussian School for Physical Trainers. Requirements for entrance, course of study, examinations, and placement of graduates are all well discussed, as to the special physical education college and all other Prussian Schools that give such training. I recommend the book to all physical educators, especially those promoting teacher training.

A. D. BROWNE
George Peabody College for Teachers

SMITH, WALTER ROBINSON. *An Introduction to Educational Sociology.* Chicago: Houghton Mifflin Company, 1929. x + 444 pp.

As the nation moves farther into the complexities of the great society, the need of a systematic understanding of the social milieu of the school becomes more imperative. Intelligent workers in all branches of the profession are looking hopefully to educational sociology for guidance, and the renewed zeal of specialists in this field shows that they are not unmindful of the opportunity.

One of the signs of new activity is the publication of this revision of one of the standard elementary texts. The general plan of the revised edition is the same as that of its predecessor in that it formulates a set of principles of sociology and then proceeds to apply them to the practices and problems of education. Part I, including the first ten chapters, provides the "Sociological Foundations" as before, and Part II, including the remaining nine chapters, gives the "Educational Applications." Part I, with the exception of the first two chapters which have been largely devised, has been changed only in details; but Part II has been reorganized and rewritten and large amounts of fresh material have been added.

The bibliographies have been brought up to date, but in a number of cases the lists omit very important investigations such as that of Counts on the Selective Character of American Secondary Education, which has a significant bearing on the subject matter of Chapter XII and which superior students even in elementary classes would be glad to read. A clear style, unmistakably careful writing, and soundly organized thought, however, give ample evidence of conscientious workmanship and abundant experience with the subject in the classroom.

The most significant departure from the plan of the old book probably lies in the addition of three new chapters on the "Student Population," the "Teaching Population and Its Problems," and "So-

cializing Our School Objectives." In Chapter XII, which will serve as an example of the general method of treatment, the expansionists trends of the kindergarten, of the elementary, secondary, and higher schools and of the schools for "un-normal" students are described and these developments are accounted for in terms of changes in social conditions. The problems, which have followed these trends, including a revamping of the school regime, the question as to the educability of the masses, and the availability of the necessary financial support, are then stated and answered. As extensive a presentation of statistical material is given on the various topics, possibly, as elementary students are prepared to assimilate.

Scientific investigation and the periodical recording of statistical data have made available to the profession a comparatively substantial body of facts, especially along these three lines. It is the continual accumulation of material of this sort and its use inductively in the formulation of general principles which can be used by educators in the direction of school practice, that are laying the framework of the new science of educational sociology which is in the making.

The time is not far distant, if it is not already in sight, when this field will possess its own body of investigational data and inductively derived principles as distinct from sociology as educational psychology is distinct from general psychology. In emphasizing such topics as the three mentioned above, in reporting the results of investigations, and in freely employing objective materials as the basis for describing trends and drawing conclusions the author points out the direction of progress and takes an important step in that direction himself.

The new book, in brief, is in step with current thought and a very worthy successor of the old.

PAUL W. TERRY
University of Alabama

HERTZLER, SILAS. *The Rise of the Public High School in Connecticut.* Baltimore: Warwick and York, 1930. xx + 258 pp.

That the public high school had its legal beginning and actual existence earlier than the establishment of the English Classical (High) School of Boston in 1821 is clearly shown by the author of this critical, historical study. Throughout an account covering 223 pages due credit has been given to the influence of the Latin Grammar School and of the Academy and the subsequent development of secondary education in Connecticut. At the same time, however, the author emphasizes the fact that the law of 1798 recognized another group of pupils than those who would attend the compulsory grammar school. The people of that early day saw that what was needed was a school for "the common benefit of all the inhabitants" and not an institution designed solely for those going to college. Thus they authorized the school of "higher order."

A decidedly modern note is struck in the old statute when the purpose of the school was stated to be, in general, "to form them for usefulness and happiness in the various relations of social life." Here was a citizenship school, supported by public taxation. So persistent has been the type that today one such school is to be found in the state. The other high schools have their origin in relation to earlier Academies or have been organized under subsequent legislation.

The story of the rise of the public high school in Connecticut is well told

and thoroughly documented. The author has used sources hitherto unknown and the results here, for the first time, are made generally available. Considerable space is given to the development of the curriculum and of courses of study with transcriptions of printed bulletins and school reports. Generous use has been made of the historical documents, many in manuscript form, to be found in the State Board of Education. Extra-curricular activities, matters relating to support and control, to teachers and their salaries, together with an occupational analysis of the parents of the high-school pupils of the state are given for different decades.

Notwithstanding the numerous private-tuition academies in the state, the evidence is clear that the high school was thoroughly representative in the social status of the pupil of the entire population of the state and, to this extent, was a thoroughly democratic institution.

Studies of the sort that Dr. Hertzler has made are all too few and not until an account of the development of secondary education, both public and private, has been written up for each state shall we have an adequate understanding of the factors which have led to the present-day high school. The careful student of origins of our social institutions would be greatly aided by this interesting book.

A. B. MEREDITH
New York University

LEONARD, JOHN PAUL. *The Use of Practice Exercises in the Teaching of Capitalization and Punctuation.* New York: Columbia University, 1930. vi + 78 pp.

In this study of instructional technique the major problem was "to determine whether the use of practice exercises in the nature of proof-reading, error correction, and dictation practice materials improves pupils' ability to write compositions free from errors." The investigation was also concerned with the following minor problems: (1) "the effect of teaching by practice exercises on the accomplishment in achievement tests in punctuation and capitalization," (2) "the permanency of learning by practice exercises," and (3) "the validity and reliability of a test to measure abilities in punctuation and capitalization."

The data for the study were obtained from tests and compositions written both before and at the close of the experiment by eighty-two pupils selected from the eighth and ninth grades of the Ethical Culture School, New York City. The pupils "were above the average in intelligence (mean IQ about 125), were interested in improving their own writing, were conscious of their mistakes, had much to learn, and were able to learn rapidly."

The pupils were paired into an experimental and a control group for each grade level on the basis of a composite test score derived from the use of the following tests: (1) Terman Group Intelligence Test, Form A; (2) Pressey Diagnostic Test in Capitalization, Form 1; (3) Pressey Diagnostic Test in Punctuation, Form 1, and (4) Leonard Proof-reading Test, Form A. In computing the composite test score the McCall technique was used.

Great care was exercised in keeping uniform all the conditions of the experiment except the matter of practice. Both the experimental and the control group in each grade were taught the same twenty-eight principles of capitalization and punctuation by the same teacher. Eleven class periods of forty-five minutes each

were devoted to teaching and practice for each group. Each lesson was mimeographed and divided into two parts. Part I, which was the same for both groups, contained "a brief review of the previous rules taught, an explanation of the rules of punctuation and capitalization to be taught for the day, a demonstration of their correct usage in a sentence, and a summary of these explanations at the end." Part II was different for the two groups. It contained "proof-reading, error correction, and dictation exercises" for the experimental group and "opportunities to apply the rules learned by some methods other than practice exercises" for the control group.

The findings of the experiment are significant and convincing. Both groups of pupils made outstanding improvement in ability to capitalize and to punctuate, as was shown by test performance and composition writing at the close of the study. The pupils taught by the use of practice exercises were almost twice as successful in eliminating errors on their compositions as were those who secured their practice by other methods; moreover, the practice exercises were very effective in establishing permanency of learning, as was shown by tests given three months after the experiment had ended. The results of this carefully controlled study of instructional technique should go far in convincing school administrators, supervisors, and teachers of English that practice exercises can be made to be very effective agencies in bringing about improvement in the mechanics of written expression.

WALTER SCRIBNER GUILER
Miami University

LANG, ALBERT R. *Modern Methods in Written Examinations.* Boston: Houghton Mifflin Company, 1930. xx + 313 pp.

Beginning with the chapter on "New-Type Examinations" and continuing through the next five chapters, the material is distinctly worthy of the purpose for which the book was written, i. e., to serve as a textbook for courses in the examination technique for teachers in training and to provide a hand book for the teachers and others desiring a guide for the purpose of instruction and the use of modern testing. The discussion throughout these five chapters is simple and straightforward and takes into account practically all of the factors to be considered in the development of the new-type test.

These five chapters might be of greater value if more illustrations were given, such as those found on page 125, giving suggestive clues to be found in multiple-response questions. Mature students can use to a good advantage practical illustrations of incorrect as well as correct forms. Especially is this true if these incorrect forms represent common and persistent mistakes.

The author uses the term "multiple-choice" with the type of item given below in which the one taking the test must choose the correct response.

"If one number is divided into another the answer is called (1) dividend (2) product (3) quotient (4) remainder (5) sum."

It seems to the writer that this should be called "multiple-response" or "multiple-answer" and not "multiple-choice." "Multiple-response-single-choice" seems quite the better term.

In the suggestion for scoring the true-false tests the author indicates that the marking of such tests by the pupils should be carried out on the left-hand side of the page. This is in agreement with the idea expressed on the subject by most authors, including the reviewer. Thinking about

this in a rather common sense fashion, it seems that the marking of these statements might well be on the right-hand side of the page. It is ordinarily easier to score on the right-hand side of the page. Certainly the pupil taking the test reads from left to right. Therefore, at the time of the completion of the reading of the item he is in the best position to mark on the right-hand side of the page. In various places in the book where this subject is discussed, the author suggests the idea of having the pupil's response on the left-hand side of the page. On page 164, however, he suggests the pupil's response to be on the right-hand side of the page.

In the chapter on "Changing Test Scores Into Grades" the author has done a very fine piece of work in showing the practical use of the "sigma or standard-deviation method." It would seem that the use of the T score might well have been worked out here because of its common use and especially since the T score would be a relatively easy step after having developed the meaning of sigma.

The negative criticism that can be made of the book is very minor in comparison to the excellency of the book throughout. The writer through experience has found it very usable for teaching purposes.

WENDELL W. WRIGHT
Indiana University

ENGELHARDT, N. L., AND ENGELHARDT, FRED. *Planning School Building Programs.* New York: Columbia University, 1930. xv + 574 pp.

The science of educational administration has reached a stage in its development well suited to the consolidation of gains. Contributions to our knowledge of any one phase of administration are so numerous and they are being made by so many individuals that student and practitioner alike have neither the time nor the ability to obtain the maximum value from the material available. The time has come when the expert should perform the task of synthesis, organization, and presentation. Professors N. L. Engelhardt and Fred Engelhardt in this their latest book have worked in a field in which they themselves stand in the front rank as contributors. They have assembled an impressive amount of material in such a way as to make it extremely worth while and readily usable.

Much attention is given to the location of school sites. One cannot help but realize that this is a notable achievement in view of the facts that property valuation and the welfare of so many individuals are both greatly affected by the location of the school plant. Size, types of sites, and their landscaping are also adequately treated.

The authors discuss, in turn, architectural service, educational service, and construction service as they are related to the building program. The case they make for the inclusion of the educational consultant in school building planning and for the proper relation of the superintendent and his staff in initiating and carrying out the program should leave no one in doubt as to the wisdom of the procedure they recommend. The three chapters devoted to architectural, educational, and construction service are altogether specific and concrete in their suggestions.

The amount of money needed and how it may be secured is taken up in later chapters under the headings, "School Building Costs," "The Cost of School Sites," "Financing the Cost of School Building Programs," and "Publicity and School Buildings." The part the survey has contributed and may continue

to contribute is likewise given attention. Although it was not the purpose of the authors to deal with the planning of school buildings, they do touch upon that problem. The appendix gives for each of the states the right of eminent domain for school purposes and the extent to which each state participates in school building construction.

The book is authoritative and complete. It is well written and judiciously illustrated with diagrams and photographs. Ample evidence is given in support of the conclusions presented. The peculiar needs of both large and small school systems have been taken into account. No superintendent or school board should in the future launch into a building program without fully utilizing the information the book contains. School architects and contractors will likewise find it useful. Students of educational administration will obtain a more thorough grasp of the techniques involved in planning school building programs than was ever possible by consulting the scattered and incomplete literature upon which they have heretofore been forced to depend.

KNUTE O. BROADY
University of Nebraska

GAST, IRA MORRIS, AND SKINNER, HARLEY CLAY. *Fundamentals of Educational Psychology.* Chicago: Benj. H. Sanborn & Company, 1929. xiii + 354 pp.

The best single word to characterize this book is eclecticism, a characteristic which the authors openly avow as one of their major criteria of inclusion and exclusion insofar as it serves the practical needs of teachers in service. The students for whom the book is intended will probably not suffer any serious mental conflict from the catholicity of the contents, even though, for the logical scientist, concepts and categories will not infrequently class irreconcilably.

Since any review is necessarily an evaluation in terms of the reviewer's biases, perhaps a brief catalog of commendations and criticisms will serve the interests of both brevity and conciseness. The present reviewer, then approves the following: 1. A greater emphasis upon the social and genetic aspects of psychology as applied to education (particularly in learning) than is to be found in many of the numerous textbooks on the market. 2. The thoughtful discussion of the nature-nurture problem and its educational implications, and refusal to consider this dichotomy as an antithesis, but rather as complimentary. 3. The detailed discussion of such concepts as intelligence and intelligence quotient, calling attention to the many earlier over-simplifications of the problems involved. 4. The inclusion at the end of the chapters of photographs of significant contributors to our understanding of human nature. 5. Some excellent summary lists of suggestions, principles, and practices, as for example that of the outline of Mental Health Habits and Practices and that on transfer of training, which adds to the usual Thorndike-Judd points of view those of Spearman and the Gestalt psychologists (Koffka).

Admitting that to some extent organization and emphasis are in the realm of taste and therefore beyond criticism, there are nevertheless some aspects of these and also some lapses of greater or less magnitude which deserve criticism.

1. Chapter X on Motivation, sandwiched in between that on Transfer of Training and the one on Perception and Memory would seem to be something of a logical *tour de force.*

2. The chapters the captions of which are derived from structural psychology,

Perception, Memory, etc., betray their dualism and lack of integration with the book as a whole both by their textual sequence and overlapping with other chapters such as Learning and Habit.

3. The chapter on Childhood and Adolescence strikes at least one reader as too brief and general to be very useful, and besides repeats material that is badly shop-worn, not to say obsolete.

4. A few sins of omission and commission may be set down. Thorndike's law of exercise and Dunlap's criticism are included, but no mention is made of Thorndike's own recent strictures. Intelligence tests are compared with other types of tests, but no mention is made of T. L. Kelley's important generalization that intelligence tests and educational tests measure essentially the same functions. Burt's regression equation purporting to evaluate the contribution of schooling and chronological age to Binet mental age is quoted with approval (p. 51) without calling into question the validity of the logic involved. Lashley's work on the neural basis of learning is quoted only to establish the essential opposite of his broader generalizations (p. 161). A biologist would no doubt boggle at "The original nature of an individual is a product of his biological inheritance, prenatal environment, and maturation" (p. 1), especially if joined to "Nurture begins nine months before the birth of the child" (p. 21). These must serve as samples of criticisms which might be extended.

In spite of these criticisms, the present writer believes that the book will prove acceptable and useful as a text for an introductory course in educational psychology.

The book has the usual questions, and in the main, well selected references at the end of each chapter.

Purdue University H. H. REMMERS

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to Editor A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

BARROWS, ALICE. "School Building Survey and Program for Warwick, Rhode Island: A Study of a Town in the Path of an Expanding Metropolitan Area," *United States Department of the Interior Bulletin*, No. 33. Washington: United States Government Printing Office, 1931. 77 pp.

A study of school building in Warwick, Rhode Island, indicating the present situation and the need for a school building program.

CAPEN, S. P., EISENHART, L. P., AND FORD, GUY S. "Report of the Survey Committee," *Bulletin of Brown University*, XXVII, No. 6. Providence, Rhode Island: Brown University (October, 1930), 143 pp.

Contains an introduction and general considerations, administration and organization, the undergraduate college foremen, engineering, Pembroke College, graduate school, teaching staff, community relations, physical plant and equipment, financial implications, with an appendix containing original data.

CONNOR, WILLIAM L., AND OTHERS. "The Curriculum," *Review of Educational Research*, 1, No. 1. Washington: American Educational Research Association, National Education Association (January, 1931), 64 pp.

A summary of research pertaining to curriculum making in general, investigations of the objectives, of the curriculum, nature of learning activities, time allotment and grade placement, measuring ability and achievement, evaluation of curricula and texts, public and private school curricula, and a bibliography.

DAWSON, HOWARD A., AND LITTLE, HARRY A. *Financial and Administrative Needs of the Public Schools of Arkansas.* Little Rock, Arkansas: State Superintendent of Public Instruction (November, 1930), 100 pp.

Contains chapters on the purpose and plan of the study, present educational conditions, the reorganized school system, financing a program of reorganized schools, units for administration of schools, county administration, negro education, and summary. Volume II, containing statistical tables, is to follow.

DEFFENBAUGH, W. S. "School Administration in State Educational Survey Reports," *United States Department of the Interior Bulletin*, No. 35. Washington: United States Government Printing Office, 1931. 34 pp.

A summary of recommendations made by 12 state educational survey reports, relating to administration and containing information relative to state boards of education, the state superintendent of

public instruction, local school administration, the county unit, community districts, and city school districts.

ENGELHARDT, N. L., AND OTHERS. *Report of the Survey of the Schools of the Panama Canal Zone.* Mount Hope, C. Z.: Panama Canal Press, 1930. 221 pp.

This survey contains a discussion of the administration of schools, the teaching staff, a population census, the present school plant, the achievement of the Canal Zone pupils, the administration of educational opportunities, the curriculum and courses of study, health and physical education, and school finance.

"Ethics in the Teaching Profession," *Research Bulletin of the National Education Association,* IX (January, 1931), Washington: National Education Association, 89 pp.

Contains material on current practices in the training schools of eight professions; arrangements for instruction in professional ethics; the selection and organization of materials; general principles of conduct; standards of conduct in relation to pupils, parents, community, and associates; and in relation to the profession in securing and terminating employment; in connection with teachers agencies, publishing, and school supply houses. Conclusions, recommendations, and bibliography.

FAIRBAIRN, HELEN E. "Opportunities for College Women: A Study of Occupations Other than Teaching Held by College Women in Buffalo," *University of Buffalo Studies,* VIII (August, 1930), 133-170.

Three hundred twenty-six college women in Buffalo were found to be engaged in the following occupations: library work, 24 percent; medicine, 14 percent; business and industry, 13 percent; social work, 11 percent; department store work, 10 percent; law, 8 percent; research, 7 percent; writing, 6 percent; museum work, 5 percent; and dentistry, 2 percent.

KLOPP, WILLIAM J. *The Relative Merits of Three Methods of Teaching General Science in the High School.* Chicago: Central Association of Science and Mathematics Teachers, 1930. 82 pp.

This report presents the results of a controlled experiment of the relative effectiveness of the textbook, lecture, and telling-demonstration methods of teaching science, covering a period of nine weeks and involving 700 pupils taught by 16 teachers. When final test scores were used as a basis for determining the relative merits of these three methods of teaching science, the lecture method was found to be superior to the other two in botany, and the demonstration method was found to be superior to the other two in physics and zoology. When progress scores were applied, the demonstration method received first choice, with the lecture method second, as contrasted with the lecture method as first choice and the textbook method second, when merely final scores were considered.

"Research in Progress, July, 1929, to July, 1930," *University of North Carolina Record.* Chapel Hill: University of North Carolina Press (October, 1930), 107 pp.

A summary of research in progress in the several departments in colleges of the University of North Carolina.

The Commonwealth Fund Twelfth Annual Report. New York: 41 East 57th Street, 1930. 85 pp.

The work of this foundation is summarized under the following topical heads: Summary of the Year's Work; The Division of Education; Public Health; Mental Hygiene; Child Guidance in Great Britain; Legal Research; The Division of Publications; Special Grants; Financial Statements; and Appropriations, 1929-1930.

TOUTON, FRANK C. "Abstracts of Unpublished Masters' Theses in the Field of Secondary-School Administration," *Bulletin of the Department of Secondary-School Principals of the National Education Association*, No. 34. Berwyn, Illinois: Department of Secondary-School Principals of the National Education Association (January, 1931), 116 pp.

Abstracts of unpublished masters' theses in the field of secondary-school administration relating to the duties and activities of principals and other administrative and supervisory officers; abilities and disabilities of secondary-school pupils; pupils' differences and curriculum adjustments; guidance and counseling; citizenship devices, moral training, and merit plans.

WEERSING, FREDERICK J., AND HAYNES, BENJAMIN R. *Annotated Index of Theses and Dissertations in Education.* Los Angeles: School of Education, University of Southern California, 1931. 91 pp.

An annotated index of theses and dissertations in education at the University of Southern California.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

ROE, WARREN A. "A Quantitative Study of the Promotion Progress of Pupils," *Educational Method*, X (February, 1931), 259-267.

The purpose of this study was to ascertain whether the promotion rates of teachers within a school varied materially. There is a slight indication that temperament, rating tendencies, and standards have something to do with promotion.

SYMONDS, PERCIVAL M. "On What Basis Should a High-School Boy Choose His Curriculum?" *Teachers College Record*, XXXII (February, 1931), 437-444.

A discussion of the factors influencing the choice of curriculum. The author suggests that, in helping a boy to choose his high-school curriculum, one should first determine his interests. In predicting how well he will succeed in the curriculum of his choice, use tests of ability: general intelligence tests for predicting success in general, and special aptitude tests for predicting success in special subjects.

EXPERIMENTAL STUDIES OF LEARNING AND TEACHING

CHEYDLEUR, FREDERIC D. "The Reading Method versus The Eclectic Method in Teaching French: A Preliminary Experiment at Wisconsin," *The French Review*, IV (January, 1931), 1-17.

The author concludes that the problem is a complex one, involving many factors, and that sufficient experimentation has not as yet been conducted to reach any substantial conclusion.

DAVIS, GEORGIA. "Procedures Effective in Improving Pupils of Poor Reading

Ability in Regular Reading Classes," *Elementary School Journal*, XXXI (January, 1931), 336-348.

The purpose of this study was to discover the pupils in grades 4 to 6 whose reading abilities were below their grade level, and to develop a program of special helps for the poor readers in the regular class period. The author shows that, of the 413 pupils whose reading grades were below the school grades in which they were working, and who secured the remedial instruction described, 188 or 46 percent had, at the conclusion of the experiment, reading grades equal to their grade level and 225 or 54 percent were still in need of improvement.

GATCHEL, D. FRED. "Results of a How-To-Study Course Given in High School," *School Review*, XXXIX (February, 1931), 123-129.

An experimental study from which the author concludes that it is possible to train pupils in methods of study and that such training will carry over to a variety of subjects.

GATES, ARTHUR I. "An Experimental Comparison of the Study-Test and Test-Study Methods in Spelling," *Journal of Educational Psychology*, XXII (January, 1931), 1-19.

In general, the author found a slight superiority for the test-study method. The study-test method was found to be slightly better in grade 2 and in the first half of grade 3. In the case of the dullest of the four or five classes at the high third and fourth grade levels, the study-test plan was slightly superior, whereas, in the brightest of these groups, the test-study plan was slightly superior.

GIESE, F. "Begriffsbild und Erkenntnisstufe" (Concept and level of understanding), *Archiv für die gesamte Psychologie*, LXXVII (1930), 552-608.

A study of the nature of psychological concepts in which three developed mental levels; namely, the phenomenological, the functional, and the concepts of fictions, are distinguished. (By courtesy of *Psychological Abstracts.*)

HILLIARD, GEORGE H., AND BARNES, MARCILLENE. "The Effect of Specific Drill on Reading Ability," *Elementary School Journal*, XXXI (February, 1931), 417-426.

The aim of this study was to determine the effect of definite purposeful drill on general reading ability for pupils whose reading scores in the Gates Silent Reading Test indicated a definite need for practice. The author concludes that children with intelligence quotients below the average can greatly improve their reading abilities, if they are provided with specific training.

HUGHES, J. M., AND MELBY, E. O. "A Cross-Section of Teaching in Terms of Classroom Activities," *Educational Method*, X (February, 1931), 285-289.

A description of teaching as shown by an activity analysis of one class recitation conducted by each of 116 teachers of the social studies in 20 high schools of the Chicago area.

MCCALLISTER, JAMES M. "The Effectiveness of Remedial Instruction in Reading in the Junior High School," *School Review*, XXXIX (February, 1931), 97-111.

An experimental study showing that remedial instruction in reading may be carried on with profit to pupils in a junior high school.

OLANDER, HERBERT T. "Transfer of Learning in Simple Addition and Subtraction, I and II," *Elementary School Journal*, XXXI (January, February, 1931), 358-369, 427-437.

An experimental study of the transfer of learning in simple addition and subtraction. The author concludes that the ability gained by children on 55 simple number combinations in addition and on 55 similar combinations in subtraction transferred almost completely to the 45 remaining simple number combinations in each of the two processes.

SYMONDS, PERCIVAL M. "Practice versus Grammar in the Learning of Correct English Usage," *Journal of Educational Psychology*, XXII (February, 1931), 81-95.

An experimental study from which the author concludes that mere repetition of correct forms causes small gain on test scores.

TURNEY, AUSTIN H. "The Status of Ability Grouping," *Educational Administration and Supervision*, XVII (January, February, 1931), 21-42, 110-127.

A summary of investigations relating to ability grouping presenting its advantages and disadvantages, and seven criteria of its success as found in published reports. Bibliography.

MEASUREMENTS, STATISTICS, AND METHODS OF EDUCATIONAL RESEARCH

CHEYDLEUR, FREDERIC D. "The Use of Placement Tests in Modern Languages at the University of Wisconsin," *Modern Language Journal*, XV (January, 1931), 262-280.

A summary of the results achieved through the use of placement tests in modern languages at the University of Wisconsin, with statistical data, graphs, etc.

GRIFFIN, HAROLD D. "On Partial Correlation vs. Partial Regression for Obtaining the Multiple Regression Equations," *Journal of Educational Psychology*, XXII (January, 1931), 35-44.

A critical analysis of the partial correlation and the partial regression methods of obtaining multiple regression equations, in which the author recommends the Doolittle method.

LARSON, SELMER C. "The Shrinkage of the Coefficient of Multiple Correlation," *Journal of Educational Psychology*, XXII (January, 1931), 45-55.

An experimental verification of the fact that there is a shrinkage of the coefficient of multiple correlation (R) when the equation is applied to a second set of data, even though these data may be strictly comparable. The shrinkage is found to increase as the number of test variables increases and as the size of R decreases.

REMMERS, H. H. "The Equivalence of Judgments to Test Items in the Sense of the Spearman-Brown Formula," *Journal of Educational Psychology*, XXII (January, 1931), 66-71.

The question to which the author seeks an answer is: Do the judgments which students record concerning their instructors follow the law represented by the Spearman-Brown prophecy formula; that is, is it valid to assume that judgments are the equivalent of test items in the sense required by the formula? The author concludes that it is probably true that, in the majority of situations in which subjective judgments are used, the

Spearman-Brown prophecy formula indicates the number of judgments required for a given reliability.

MISCELLANEOUS

HAGGERTY, M. E. "The Improvement of College Instruction through Educational Research," *Educational Record*, XII (January, 1931), 43-70.

A summary of researches at the University of Minnesota, relative to the improvement of college instruction.

WILSON, J. H. "The Nature of Intelligence," *Journal of Educational Psychology*, XXII (January, 1931), 20-34.

A statistical analysis of the nature of intelligence. The author finds a central factor running through all the performances and a number of other factors specific to each performance. He also finds evidence of a group factor.

NEW TESTS

DOUGLASS, HARL R. *Objective Tests on Modern Methods in High-School Teaching.*" New York: Houghton Mifflin Company, 1931.

Contains three types of exercises: true-false, multiple-choice, and enumeration, based upon Douglass's *Modern Methods in High-School Teaching.*

DROBA, D. D. *The Measurement of Social Attitudes.* 2. Attitude toward War. Chicago: University of Chicago Press, 1930.

Two forms, each consisting of 22 statements which the subject checks or crosses out according to whether he agrees or disagrees with the statement made. Each has a scale value, and the median of these is the score. Reliability for each form about .83, for both about .90. (By courtesy of *Psychological Abstracts.*) See also: Droba, D. D. "A Scale of Militarism-Pacifism," *Journal of Educational Psychology*, XXII (February, 1931), 96-111.

BIBLIOGRAPHIES

PIÉRON, HENRI. "Bibliothèque de Philosophie Contemporaine," *L'Année Psychologique*, 2 volumes (108, Boulevard Saint-Germain, VI^e^, Paris: Librairie Félix Alcan, 1929).

An annotated and classified abstract of psychological literature appearing in English, French, German and other psychological publications during the year 1929. Furnishes a valuable summary of the literature of this field.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Editor Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Work of the Research Division, N.E.A.—The Research Division of the National Education Association is one of the nine major divisions into which the headquarters staff of the association is divided. The chief function of the division is to collect, organize, and distribute factual material on educational problems. In achieving this objective, three principal channels of service are used: publications, correspondence, and consultation.

The chief publication is the *Research Bulletin*, issued five times a year. At present 100,000 copies of this bulletin are distributed annually. The titles of the *Research Bulletin* for the past two years suggest the fields of interest which it covers: "Can the States Afford to Educate Their Children?" "The Principal and Progressive Movements in Education;" "Salary Scales in City School Systems, 1928-29;" "Vitalizing the High-School Curriculum;" "The Principal as a Supervisor;" "The Questionnaire;" "A Self-survey Plan for State School Systems: Part I, Checklists;" "A Self-survey Plan for State School Systems: Part II, Handbook;" "Investing in Public Education;" and "Current Issues in Teacher Retirement."

Other avenues of publication include: statistical tables and other material in the *Journal of the National Education Association*, a series of brief studies in state school administration, and articles prepared by the staff for professional journals.

Correspondence is the second means by which the Research Division achieves its function. In a typical year, it sends out approximately 50,000 pieces of mail, about 10,000 of which are letters in response to requests for information from members of the Association and others. Some of these inquiries can be answered easily; others require hours or days of search for pertinent references or statistics.

The third channel of service involves consultative and editorial arrangements between the Research Division and the various committees and departments of the National Education Association. Major responsibilities of this type have been discharged during the past few years with the following: Committee on Retirement Allowances, Committee on Teacher Tenure, Committee on Propaganda in the Schools, Yearbook Commissions of the Department of Superintendence, Yearbook Committees of the Department of Elementary School Principals, and the National Council of Education.

The staff of the Research Division now includes about thirty members. The director is responsible to the Executive Secretary and the officers of the Association. Associated with him are an associate director and three assistant directors. Although all major investigations are projects of the division as a whole, each of the directors has a field of special interest and responsibility:

curriculum and guidance, personnel problems, state school administration, and supervision.

The remaining members of the staff are organized for work into four sections, each having its special functions. A group of research assistants gathers and annotates bibliographies, traces down needed statistics or other material, and, under the immediate guidance of one of the directors, organizes some of the basic material for later use in answering inquiries or preparing bulletins. The library of the National Education Association is administered through the Research Division, although it renders service to the entire headquarters staff. Its functions are the care and collection of books and other published materials, the location of references, and such other functions as are generally assigned to library workers. The correspondence section handles all incoming and outgoing mail, maintains and files, and types manuscripts. The statistical section carries on computations and tabulations and prepares graphic material.

The projects undertaken are of two general types: those which are continuous, and special studies which are undertaken from time to time. Examples of the continuous studies are the regular biennial summary of salaries paid in city school systems, the annual summary of school legislation, and the bi-monthly summary of education as discussed in lay magazines. Reports on a number of the special studies are presented in the *Research Bulletins* listed above.

The Research Division collaborates with the Department of Superintendence in the maintenance of the Educational Research Service. This service is a clearing house of facts on school administration, for which a special fee of $25.00 a year is charged. There are now 300 subscribers to this service. Each subscriber is sent many publications on various phases of modern education and is assured of prompt and special service in response to requests for information.

In the nine years since its inauguration, the division has conducted investigations in a number of fields of educational interest. Problems of the teaching profession have been studied from many angles. Its publications are the principal store-house of theoretical and factual material concerning teachers' salaries. Hundreds of local communities are rendered special salary service each year. A well-known economist recently listed the work of the National Education Association as one of the important factors responsible for the substantial improvement of the economic status of teachers in the last decade. The division's work affecting teacher retirement and other welfare problems is well known, particularly in states where such problems are live issues.

Problems of school finance have received a major share of attention and the bulletins dealing with this field have had extensive use. School legislation, curriculum revision, and the work of the principalship are other topics on which major emphasis is placed. The Research Division at all times welcomes correspondence and advice regarding its objectives and their attainment. The cordial interest and cooperation of school people and others in its work have contributed powerfully to the success already achieved.

Annual Report of the Commissioner of Education Explains Reorganization of the Office of Education for Research—Since the establishment of the United States Office of Education in 1867, the Commissioners have been as follows:

Henry Barnard, 1867-1870; John Eaton, 1870-1886; N. H. R. Dawson, 1886-1889; W. T. Harris, 1889-1906; E. E. Brown, 1906-1911; P. P. Claxton, 1911-1921; J. J. Tigert, 1921-1928; and W. J. Cooper, 1929.

The Annual Report for the fiscal year ending June 30, 1930, includes a statement of the principles upon which the recent reorganization of the Office is based:

1. That the reasons for which Congress established the Office of Education; namely, the collection of school statistics and a wide dissemination of information on education, are still valid and should receive chief emphasis by the staff.

2. That such promotional activities as had been assumed from time to time, and chiefly during the war period, should be eliminated as rapidly as possible.

3. That the demand for more fundamental research in education, indicated in part by bills calling for the creation of a Department of Education and appropriations for research, and also by petitions and memorials from organized professional groups requesting investigation of particular projects, is fully justified.

4. That the administrative responsibilities gradually accruing to the commissioner and his staff over a period of some forty years and arising in particular from the education and medical relief of natives in Alaska should be transferred to other officials as rapidly as possible.

5. That certain service functions gradually developed by the Office should be continued partly because they furnish the best means of disseminating information, partly because they furnish the only means of keeping members of our staff in direct contact with actual school problems, and partly because situations arise in local and state governments where an agent of the federal government is the only satisfactory person to serve as a referee.

6. That the local autonomy of American education can best be preserved by having in Washington a staff large enough to perform adequately these regular and recurring duties and by augmenting this staff temporarily for the performance of specific technical tasks, as needs arise, from the experts employed in universities and colleges and the public-school system.

7. That such specific tasks be undertaken only at the request of and with the approval of well-established, organized professional groups; and that each project so approved be submitted to Congress on its own merits and carried on with funds provided for that specific purpose.

8. That every effort be made to locate researches now under way in education, to cooperate with the local governments, universities, and volunteer agencies which are making such studies, and, in so far as possible, to coordinate the efforts of all such groups.

The report describes the work of the various divisions of the Office of Education: administration, editorial, library, service, and research and investigation (with subdivisions of colleges and professional schools, special problems, American schools, statistics, and foreign schools). The surveys of secondary education and teacher education are described.

National Survey of Education of Teachers—Nearly one million questionnaires have been distributed to the teachers of American public schools by the Federal Office of Education to obtain data in the National Survey of the Edu-

cation of Teachers. Authorized by Congress under an appropriation of $200,000 upon the request of leading national educational organizations, the survey will consume three years. Its chief purpose is to assemble information to combat the nation-wide oversupply of teachers. Filling out the questionnaire will require only ten minutes. It has been distributed through state superintendents of education and city superintendents and asks each teacher for the following information: description of work, number of teachers in same building, classes in school, other school responsibilities, training, sex, marital status, type of community, experience, employment, salary, degrees, semester credits earned, if new in school (where from), and teaching load. The associate director in charge is E. S. Evenden of Columbia University.

Three School Surveys—The Division of Field Studies, Teachers College, Columbia University, recently has directed surveys of schools in Watertown, Massachusetts; the Panama Canal Zone; and Fort Worth, Texas. The Watertown survey made under the direction of G. D. Strayer, N. L. Engelhardt, Carter Alexander, Paul R. Mort, and John K. Norton of the staff of Teachers College, Columbia University, covers six fields:

1. A study of the classification and progress of school children in all departments with suggestions for the improvement of the classification of the pupils in the school system.

2. A study of the administration of schools.

3. A study of the present educational organization together with recommendations concerning any needed reorganization of the school system.

4. A complete survey of the existing school buildings.

5. A school building program including a study of trends of population together with estimates of the need for school buildings during the period of the next fifteen years, recommendations with respect to the use of the buildings already erected, and the general location of new buildings to be constructed.

6. An analysis of the present school costs; the ability of the community to support the schools as at present organized; and the additional costs involved in any reorganization, on account of the building program, related to the ability of the community to finance the program.

Watertown has a limited form of town government, an institution peculiar to New England, and a school system which is fiscally dependent upon this town government. The report on the survey was made to the School Committee and the Special Town School Survey Committee on December 30, 1930. The final report on the survey will be made before the Town Meeting which will be held in March, 1931. The report of the survey is being printed by the Bureau of Publications, Teachers College, Columbia University.

The survey of the schools of the Panama Canal Zone, directed by N. L. Engelhardt, was made in the spring of 1930. In addition to the director, Carter Alexander and W. S. Elsbree of the staff of Teachers College, with R. L. Hamon, Guy L. Hilleboe, and twenty-one other assistants participated in the field work during April, 1930. The report covers all phases of educational work in schools of both white and colored people. The report of 221 pages has been published by the Panama Canal Zone authorities and copies may be secured from the Panama Canal Office at Washington, D. C., or at the superintendent's office.

Balboa Heights, Canal Zone. Of especial interest to those interested in survey work will be the problems involved in school administration, the high achievement of pupils, the recommendations for curriculum advancement, and the extension of educational facilities for both the "gold" and "silver" employees of the Zone.

A complete survey of the school system of Fort Worth, Texas, is being conducted under the direction of George D. Strayer, N. L. Engelhardt, Carter Alexander, Paul R. Mort, John K. Norton, C. J. Tidwell, J. F. Williams, C. L. Brownell, and H. B. Bruner. These members of the staff of Teachers College will be assisted in the field work by thirty other workers consisting of members of advanced courses in administration at Teachers College. The field work of the survey was done during the months of January and February, 1931, and a report will be submitted to the board of education at Fort Worth late in the spring.

Bureau of Research, Chicago Public Schools—Superintendent William J. Bogan of Chicago has an Advisory Committee of "outsiders"—civic, business, and labor leaders. During the recent preparation of the 1931 school budget, this committee waged a vigorous battle before the board of education on behalf of appropriations for ten educational needs which had not been provided for in the tentative budget. The committee was partly successful in that the sum of $75,000 was set aside to reduce the elementary-school class size by the employment of fifty new teachers, and a new bureau of research was created, to be known as the Bureau of Research and Building Survey.

This new bureau probably will combine true research with applied research and service in the field of education, finance, buildings, and exhibits. Its personnel will consist of a director, an assistant director of educational research, an assistant director of building survey, an assistant in building survey, a supervisor of exhibits, and four clerks. Superintendent Bogan has selected Don C. Rogers, National Secretary of Phi Delta Kappa and a member of the American Educational Research Association, as director of the new bureau. All of the personnel except the assistant director of educational research have been chosen.

American Educational Research Association Program—Much interest at the Detroit meeting was shown in the national surveys of education. The program of the American Educational Research Association included discussions of: "The Techniques of the Teacher Training Survey," E. S. Evenden; "The Techniques of the Secondary Education Survey," L. V. Koos; "The National Advisory Committee Survey," Harlan Updegraff; and "The Land Grant College Survey," A. J. Klein. A similar program of the National Society of College Teachers of Education was described in the February issue of this department. Other problems discussed by the Research Association were: studies of the college freshman, problems of research bureaus in state school systems, instructional research, statistical techniques, philosophy and research, and the improvement of college teaching.

The first number of the new publication of the Association, *Review of Educational Research*, appeared in January under the title, *The Curriculum*. It contains chapters on investigation of curriculum objectives, nature of learning activities, time allotment and grade placement, measuring ability and achieve-

ment, evaluation of curriculums and texts, and public- and private-school curriculums.

New Research Association—The Educational Research Association of New York State was organized at Syracuse on December 29, 1930, held a luncheon meeting attended by 147 persons, carried out an interesting program, and at a business meeting adopted a constitution and elected officers for the coming year. The purpose of this association is to encourage and promote educational research through publications, meetings, investigations, and like means of cooperative endeavor. The officers are:

President, W. W. Coxe,
Director of Division of Educational Research, State Education Department, Albany.

Vice President, Harry P. Smith,
Director of Research of Syracuse Public Schools and Professor of Education at Teachers College, Syracuse University.

Secretary-Treasurer, A. L. Maxon,
Director of Research, Department of Public Instruction, Schenectady.

Director, J. E. Butterworth,
Professor of Rural Education, Cornell University.

Director, Ralph Walter,
Director of Research, New Rochelle.

Conference on College Hygiene—At Syracuse University, Syracuse, New York, May 5-9, 1931, there is to be held a National Conference on College Hygiene. This conference, sponsored by the Presidents' Committee of Fifty on College Hygiene, the American Student Health Association, and the National Health Council, has a very clear cut and definite purpose: namely, an agreement upon desirable minimum standards for colleges and universities concerning: (1) health service, (2) health teaching, (3) interrelationship and correlations of student physical welfare activities, and (4) miscellaneous problems, including those concerned with social hygiene, mental hygiene, tuberculosis, extra-curricular activities, and other related problems which may be presented for consideration. Dr. Thomas A. Storey is chairman.

New Psychological Journal.—In January, 1931, a quarterly review dealing with the psychological problems of juveniles made its appearance. The title is *Vierteljahresschrift für Jugendkunde*, edited by Professor O. Tumlirz of the University of Graz, Austria, and published by Julius Klinkhardt, Leipzig C 1, Liebigstr. 6. The periodical is intended to provide information concerning the psychology, education, research literature, and case studies of juveniles in order that such knowledge may be applied in pedagogical practice.

New Liberal Arts Publication—The second number of the *Liberal Arts College Bulletin* appeared in January, 1931. This is a bimonthly journal published in the interest of the Liberal Arts College Movement under editorship of a Committee of Fifteen, with an executive office at 815 Fifteenth St., N. W., Washington, D. C.

Abstracts of Graduate Theses—Approximately two hundred Doctors' and fifteen hundred Masters' theses in education are completed each year. Most of these studies are available only in typewritten form in university libraries. In view of these facts, it seems desirable that each institution publish at least an

annual volume of abstracts of the graduate studies completed. The University of Chicago has followed such a practice in the case of its Doctors' dissertations for some time. The University of Pittsburgh has issued its sixth volume of abstracts, a 464-page book, under date of November 15, 1930, which summarizes the theses of all departments, lists studies of staff and students in progress, and gives a bibliography of faculty publications. Vol. XVIII, No. 2, October, 1930, of the *University of Colorado Studies* is devoted to abstracts of theses for higher degrees awarded in 1930.

Teachers College, University of Cincinnati, has at work an editorial committee, consisting of Carter V. Good, W. L. Collins, and C. A. Gregory, which is preparing a volume of abstracts of some twenty-five Doctors' and 125 Masters' theses in education completed during the past six years.

Objectives of Graduate Work at Peabody—A recent statement from George Peabody College for Teachers outlines its program of graduate research as follows:

1. Research, i.e., to make scientific studies of all public-school and allied problems, including (a) what modern society needs from the public school and (b) what the child can hope to get from the public school;

2. Organization, i. e., to select educational material which meets these needs, and to coördinate it into the most practical teachable form;

3. Testing, i.e., to experiment with such material until results are achieved with it and with methods of teaching it which will work under the practical conditions of the ordinary schoolroom; and

4. Distribution, i.e., to teach, publish, and otherwise disseminate such results in order that they may be applied to actual public school work as widely and immediately as possible.

Research Program at California—In the School of Education at the University of California, research is carried on by individual professors and their graduate students rather than by the school as an organization. Occasionally studies are printed by the University Press when the Publishing Committee believes that they would be of service to enough people to warrant such publication.

The research and service center of the Division of Vocational Education has published thirty-one bulletins and leaflets in six series during the last few years. In addition, it edits and publishes a magazine entitled *Vocational Education News Notes.*

The program in the field of tests and measurements takes two general directions. First, there is a series of studies on the comparative reliabilities and validities of standard tests. There are completed but unpublished investigations of reading tests, physics tests, and certain intelligence tests in the lower grades. A second series of investigations is being published, from time to time, in the *Journal of Educational Research* under the general caption, "Minor Studies in Objective Examination Methods."

Research in the field of school finance includes a study of the policy of financing public educational institutions in the following countries: Austria, Czechoslovakia, England, France, and Germany. This report is being prepared for press at the present time. Work on a plan for an equalization fund for the State of California has been under way for two years and will be presented in the form of a recommendation to the present legislature. A study of teachers' salaries in San Francisco was published

by the San Francisco Teachers' Salaries Committee.

The professors interested in school housing and building have completed surveys of the City of Pasadena and of Contra Costa County. Both of these are in process of publication. These same professors have served as consultants in the formation of school building plans in fifteen cities and districts in California, Washington, and Utah.

Work in the field of curriculum revision has been carried on at both secondary and elementary levels. Investigation of the secondary-school curriculum includes a study which, it is hoped, will lead to a check on the validity and reliability of procedure in such matters as statement of objectives, selection and arrangement of course content, consideration of instructional material in terms of available teaching methods, and the administrative organization for a plan of curriculum revision in a school system. A study of heroes and heroines of junior and senior high-school pupils, made in an effort to determine deficiencies in programs which try to teach ideals was recently published by the University Press under the title, *The Person Consciousness of High-School Pupils.*

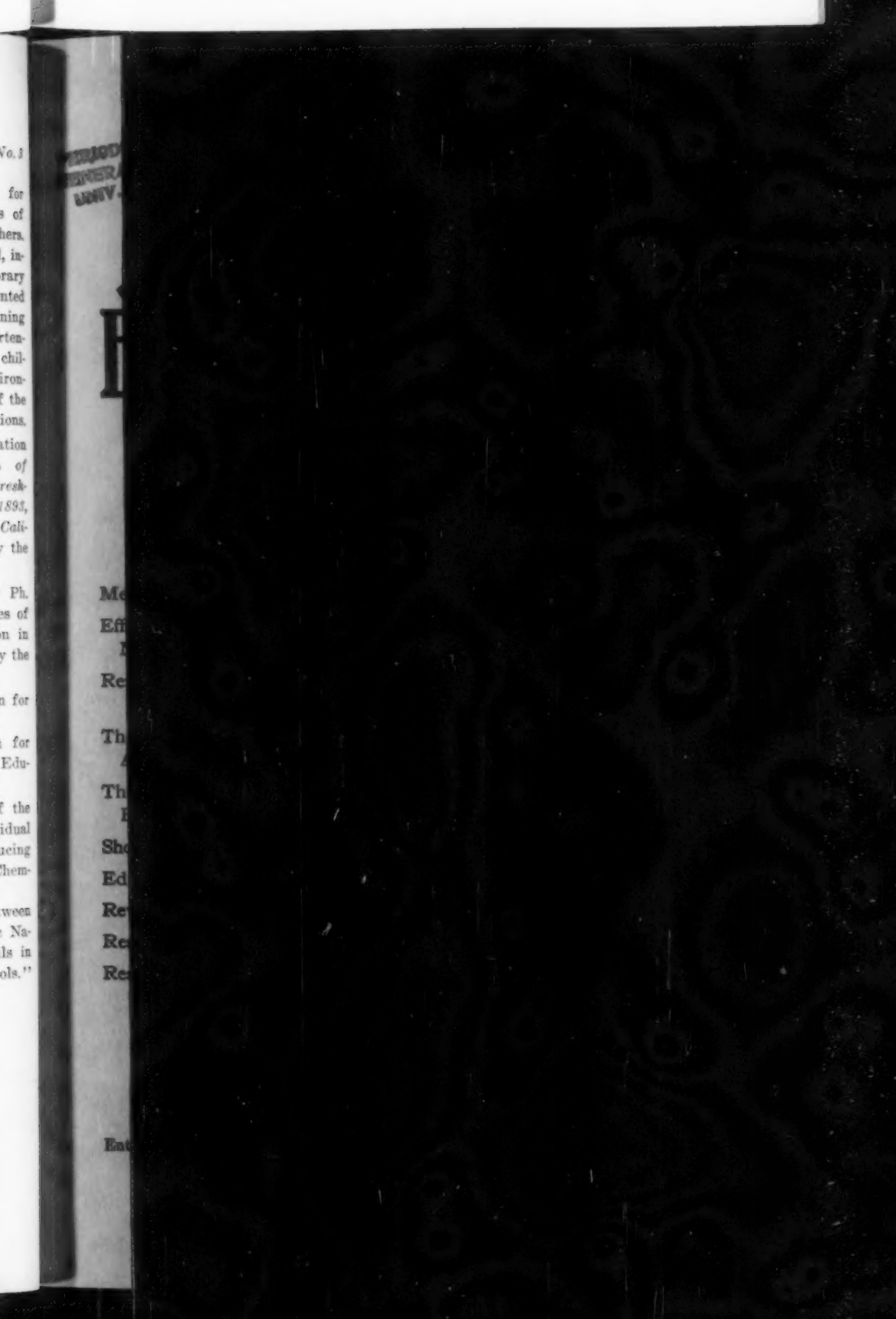
Study of the elementary-school curriculum in coöperation with the California Curriculum Commission has resulted in the publication by the state board of education of the *Teachers' Guide to Child Development for Kindergarten and Primary Grades.* This enterprise involved collection of directions, from teachers and supervisors throughout the state, for class-room procedure and for units of work carried on by superior teachers. These directions have been organized, interpreted in the light of contemporary educational theory, and supplemented with statements of standards concerning the organization of the kindergarten-primary unit, the classification of children, the school and class-room environment, the daily program and work of the teacher, and other relevant considerations.

In a more general field of investigation are studies on *The Construction of Orientation Courses for College Freshmen,* and *Emma Marwedel, 1818-1893, Pioneer of the Kindergarten in California* which are being published by the University Press.

Kentucky Doctors' Theses—Four Ph. D. dissertations under way, the titles of which arrived too late for inclusion in the January *Journal,* are reported by the University of Kentucky.

Galloway, O. F. "Higher Education for Negroes in Kentucky."

Moore, W. J. "A Proposed Plan for the Financial Administration of Education in Kentucky."

Payne, Virgil. "A Comparison of the Lecture-Demonstration and Individual Laboratory Methods of Introducing College Students to First-Year Chemistry."

Weir, H. L. "The Relationship Between Scholastic Record and Geographic Nativity of Eastern Kentucky Pupils in Berea College and Secondary Schools."